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BRITISH MEDICAL JOURNAL

LONDON SATURDAY NOVEMBER 5 1949

LIVER DAMAGE PRODUCED BY FEEDING ALCOHOL OR SUGAR AND ITS PREVENTION BY CHOLINE*

BY

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[WITH PHOTOGRAVURE PLATE]

One of the first suggestions that over-indulgence in alcoholic beverages may damage the liver was made by Thomas Addison, physician to Guy's Hospital, London (Addison, 1836). He wrote: "With respect to the causes of this fatty degeneration of the liver, very little, or absolutely nothing, is known. In most of the cases which I have met with, there has been either positive or strong presumptive evidence that the individual had indulged in spirit-drinking; and indeed the most exquisite case I ever saw in a young subject occurred in a female who had for some time subsisted almost exclusively on ardent spirits. On the other hand, the extreme frequency of the degeneration in France, where the people are but little given to such indulgence, throws considerable doubt upon such an origin of the complaint."

A few years later Rokitansky (1849), pathologist to the Imperial Royal General Hospital in Vienna, reached a similar conclusion concerning the responsibility of alcohol for at least one type of fatty liver. Rokitansky noted the frequent occurrence of cirrhosis of the liver in drunkards. He was possibly the first to suggest that cirrhosis follows fatty changes in the liver.

The earliest references to experimental studies of the effects of alcohol were concerned with its effect on the brain (Dahlström, mentioned by Magnus Huss, 1852; Duchek, 1853). Kremiansky (1868), in the course of similar investigations, noted that one of four dogs receiving increasing doses of alcohol up to 6 oz. (170 ml.) daily for three months developed fatty changes of the liver and heart and a catarrhal condition of the kidneys. Ruge (1870), however, seems to have been the first to show clearly that an accumulation of fat occurs in the livers of dogs given increasing daily doses of alcohol by stomach-tube. He noted incidentally that the nature of the diet influenced the amount of fat found in the liver.

Moon (1934), in his comprehensive and critical review of the experimental work on alcoholic cirrhosis, concluded that none of the experimental procedures had been successful in producing cirrhosis in animals, other than rabbits, by alcohol alone. He pointed out that many of the so-called "positive" results with rabbits must be discounted owing to the presence of intercurrent liver infections (coccidiosis, etc.) or to a chronic periportal inflammation which is common among adult untreated rabbits. Moon concluded: "Without minimizing the contributory or predisposing influence which alcohol may exert, it must be concluded that experimental evidence has not substantiated the belief that alcohol is a direct cause of cirrhosis."

Experimental evidence that long-continued presence of abnormal amounts of fat in the liver does give rise to cirrhosis was supplied by Chaikoff, Connor, and Biskind (1938) using depancreatized dogs which had been maintained with insulin for periods up to five years. Production of cirrhosis in normal dogs by feeding alcohol to animals in which a fatty liver had previously been established by dietary means was reported by Connor and Chaikoff (1938), but the relationship of the alcohol to the cirrhosis became questionable when Chaikoff and Connor (1940) produced cirrhosis in normal dogs by dietary means alone (high fat and low protein). A series of papers from the National Institute of Health, Bethesda, Maryland, reported that the consumption of alcohol by rats increased the severity of dietary cirrhosis and that supplements of choline chloride or of methionine (or an increase in the dietary casein) prevented the development of cirrhosis and were beneficial in its treatment (Daft, Sebrell, and Lillie, 1941; Lillie, Daft, and Sebrell, 1941; Lowry, Daft, Sebrell, Ashburn, and Lillie, 1941; Lowry, Ashburn, Daft, and Sebrell, 1942; Lillie, Ashburn, Sebrell, Daft, and Lowry, 1942).

More recently, however, Ashworth (1947) concluded that alcohol exerts a toxic effect even when the diet is adequate. Rats on high-casein diets and others on low-casein diets were given 1.5 ml. of 25% alcohol per 100 g. body weight by stomach-tube daily for two months, and 10% alcohol was supplied in place of drinking-water; control groups without alcohol were "pair-fed" the same basal diets. Since all the rats lost weight, whether alcohol was present or not, it is questionable whether the basal diets were adequate. Interpretation of the data is therefore difficult (see "Discussion").

Although Ashworth (1947) pair-fed his rats, the calorie intake of those consuming alcohol was considerably in excess of those drinking water. To determine what effect calorie imbalance might have upon the results, we have performed experiments in which, for the first time in a

*A very brief account of this work was presented at the Detroit Meeting of the American Physiological Society, 1949.

study of the effects of alcohol, isocaloric pair-feeding has been used. Groups of rats not receiving alcohol were isocalorically pair-fed with those ingesting alcohol. The extra calories (equivalent to those supplied by the alcohol) were provided as finely powdered sucrose.

The effects of various lipotropic supplements added to the diets of the rats consuming alcohol were studied. The pathological changes in the liver produced in these experiments are attributed to an imbalance of calories and vitamins, particularly to an induced inadequacy of lipotropic factors consequent upon the increased calorie intake. Adequate amounts of choline chloride, methionine, or casein always protected the liver. Under these particular experimental conditions there is no more evidence of a toxic effect of pure ethyl alcohol upon the liver cells than there is of a poisonous action of an amount of sucrose which supplies the same calorie intake. In fact, there is no suggestion that either alcohol or sucrose exerts a direct hepatotoxic effect. The fatty and fibrotic changes are due to a deficiency of the lipotropic factors.

Experimental

A total of 188 male rats (150 to 200 g.) were divided among 12 groups unequal in numbers but with comparable weight distribution (see Table I). The animals were housed

TABLE I.—*Liver Lipids and Fibrosis*

Supplement	Diet Alone *ad lib.*	Diet *ad lib.* + Alcohol	Diet Alone (Pair-fed)	Diet Pair-fed + Sugar (Isocaloric)
None ..	**0** (10) 10% 0/6	**2** (20) 18% 7/15	**3** (32) 10% 2/28	**4** (12) 26% 7/9
Choline chloride 0·5%	**1** (6) 6% 0/6	**5** (20) 7% 0/18		**6** (12) 6% 0/12
Methionine 0·5%		**8** (20) 7% 0/18		**7** (12) 7% 0/10
Casein 17%	**9** (12) 7% 0/10	**10** (20) 8% 0/18		**11** (12) 7% 0/11

Average daily food consumption (without alcohol), 14 to 15 g.
Average daily food consumption (with alcohol), 11 g.
Alcohol supplied 18% total calories in Groups 2, 5, 8, and 10.
Group numbers in bold face type and original number of rats per group in parentheses. Average total liver lipids as percentage of fresh liver weight is shown below group number; number of livers showing fibrosis is given as numerator of a fraction in which denominator is the number of livers carefully examined after rats had eaten diets for 6 months.

in individual all-metal cages provided with a false bottom of coarse wire screen. A 15% (by volume) aqueous solution of purified ethyl alcohol was given in place of drinking-water to four groups of rats throughout the whole experimental period, which lasted 177 days. These groups (2, 5, 8, and 10) were offered their respective diets and the alcoholic solution *ad libitum*, and the amounts of each consumed were recorded daily. Four other groups of rats (4, 6, 7, and 11) started four days later were fed the same amount and kind of diet consumed by Groups 2, 5, 8, and 10, respectively. An attempt to achieve calorie equivalence was made by adding enough powdered sucrose to each of the former diets to supply the calories provided by the alcohol consumed by the corresponding group. These groups of rats and the remaining ones were given tap-water *ad libitum*. To assess the effects of the extra calories provided by the alcohol (or sucrose supplement) it is necessary to know the effects of the amount of basal diet consumed by the rats of Groups 2 and 4. The rats of Group 3 (started four days later than those of Group 2) were therefore "group pair-fed" on a diet-weight basis with those of Group 2. Only 12 rats were available for this group when the main experiment was started (June 24, 1948); 20 rats (referred to as Group 3A) were started one month later under identical dietary conditions. The rats of Group 0 were included to observe the effects of the basal diet alone when offered *ad libitum*, and those of Groups 1 and 9 were used to study the effects of the lipotropic supplements (choline and protein, respectively) when added to the basal diet and fed *ad libitum*. Further experimental conditions will be described in detail in the following paragraphs.

The Diet

A basal ration was desired which would be as nearly adequate as possible in all its dietary components except the lipotropic factors. However, it was considered inadvisable to permit an excessive accumulation of liver fat, since any effect attributable to alcohol alone would be difficult to assess if superimposed on a liver made excessively fatty by the basal diet. The small amount of choline chloride (0.05%) added to the basal ration was determined by preliminary experiments to be just sufficient to maintain the total liver lipids at about 10%, which was arbitrarily considered to be a satisfactory basal level for these particular studies.

The basal diet had the following composition, in percentages: casein 10, gelatin 5, zein 3, cystine 0.3, salts (Beveridge and Lucas, 1945) 5, celluflour 2, sucrose 41.7, starch 10, dextrin 10, beef fat 10, corn oil 2, "vitamin powder" 1, cod-liver-oil concentrate* 0.015, α-tocopherol acetate 0.01, choline chloride 0.05. The "vitamin powder" contained thiamin hydrochloride 0.5 g., riboflavin 0.25 g., pyridoxin hydrochloride 0.2 g., calcium pantothenate 1 g., nicotinic acid 1 g., folic acid 0.05 g., 2-methyl-1-4-naphthoquinone 0.1 g., para-amino benzoic acid 10 g., and inositol 50 g., made up with finely powdered sucrose to 1,000 g. Rats consuming 10 g. of diet daily received 50 μg. of thiamin hydrochloride and corresponding amounts of the other vitamins.

The methionine content of the diet was estimated to be 420 mg. and the cystine content (with the supplement) was 380 mg. per 100 g. Using calorie values per g. of 4 for protein, 4 for carbohydrate, and 9.3 for fat, the energy content of the basal diet was calculated to be 4.35 calories per g., of which 58% was contributed by the carbohydrate. The diets were freshly prepared at least once a week. The major dry ingredients for 5 kg. of diet were thoroughly mixed in a Hobart food-mixer, and a small portion (about 500 g.) was spread in a thin layer on a large tray. The minor ingredients (vitamin powder, cystine, or methionine) were ground individually in a mortar with small portions of the dry mixture, and this was then sifted (40-mesh sieve) over the surface of the material in the tray. The choline chloride was ground separately until uniform with about 10 g. of the dry mixture, and then more of the dry mixture was added to the mortar until about 40 g. was present. This mixture was sprinkled over the surface of the material in the tray. The cod-liver-oil concentrate and α-tocopherol acetate were dissolved in petroleum ether and sprayed over the same mixture. The contents of the tray were mixed by hand and then returned to the Hobart mixer and blended thoroughly. The beef fat was melted and brought to a temperature of 130° to 140° C., the corn oil was added, and the hot fat was poured all at once into the mixer and blended until uniform. The diets were kept in tightly closed tinned cans in a refrigerator at about 4° C. until required for use.

Alcoholic beverages and commercial ethyl alcohol contain compounds other than ethanol. To what extent the other components (in some cases unknown) contribute to the effects of alcohol upon the liver cannot be stated. Since

*This concentrate (Ayerst, McKenna, and Harrison, Ltd., Montreal, Canada) contained 200,000 i.u. vitamin A and 50,000 i.u. vitamin D per g.

the effects of ingesting alcohol may be due to the contaminants, the ethanol, or the ratio of dietary calories to the adequacy of other nutriments, it was considered important to eliminate the contaminants as completely as possible. Freshly prepared silver oxide (about 10 g. per litre) was added to so-called pure 95% ethyl alcohol. The mixture, shaken frequently, was left at room temperature for at least 24 hours. The alcohol was then decanted, made just alkaline with sodium hydroxide, and distilled through a packed fractionating column running at a reflux ratio of about 10 to 1. The first 20% of distillate was rejected, about 50% was collected, and the remainder was discarded. A 15% (by volume) aqueous solution of this material replaced the drinking-water of four groups (2, 5, 8, and 10) of rats. Fresh liquid was supplied twice a week. It was dispensed to the rats from 6-oz. (170-ml.) medicine bottles through a short piece of curved glass tubing with a tip slightly constricted in the flame so that liquid would not run out unless the rat lapped it. Sudden movements of the cage door were avoided to minimize leakage, since it was found that jarring the bottle permitted loss of a few drops of liquid. Losses due to evaporation were shown to be negligible (less than 0.3 ml. per day). Whenever, for any reason, abnormally large amounts of liquid seemed to have been consumed, leakage was suspected ; the average consumption of alcohol during the previous week was then used to calculate the calories thus obtained by the rat.

Technique of Feeding

The animals in Groups 2 and 4 were paid-fed on an isocaloric basis. The technique used in this isocaloric pair-feeding (which applies also to Groups 5 and 6, 8 and 7, 10 and 11) will be described in detail. The rats of Group 2 consumed the basal diet *ad libitum*, with 15% alcohol to drink ; the total calorie intake was determined from the average consumption of food and alcohol over three-day periods. The rats in Group 4 (started four days later) were offered the basal diet in an amount equal to the average value noted for those in Group 2, and enough finely powdered sucrose was added to this food (with thorough mixing) to supply the calories contained in the average amount of alcohol consumed by the rats of Group 2. The calculation of the amount of sucrose required was made on a somewhat arbitrary basis. Mitchell and Curzon (1940), in a review dealing with the food value of ethyl alcohol, stated that "for reasons at present unknown the energy of alcohol is not as well utilized in metabolism as is the energy of glucose." Mitchell (1935) estimated that the energy of alcohol is only about three-fourths as available for physiological purposes as that of sucrose. He stated that its growth-promoting power is definitely less than that produced by a sucrose supplement. In the absence of more specific information we assumed that calories from alcohol were only three-quarters as effective in causing gains in weight as were those of the sucrose supplements. Since 1 ml. of absolute ethyl alcohol weighs 0.79 g. and the calorie value is given as 7.1 cal. per g., then 1 ml. contains 5.6 cal., or 1 ml. of 95% alcohol corresponds to 5.3 cal. One ml. of a 15% by volume dilution of the 95% alcohol would supply 0.8 cal.: finally, if only three-quarters of this is available for promoting gains in weight, then 1 ml. is equivalent to 0.6 cal., or approximately to 0.15 g. of sucrose.

The rats were maintained on these dietary regimens for 177 days. Pairs of rats chosen at random from Groups 0, 2, 4, 5, 7, 8, 9, and 10 were killed at three weeks to determine to what extent deposition of liver lipids was taking place ; again after 12 weeks pairs of rats from Groups 2 and 3 were sacrificed. All rats were anaesthetized with sodium amytal (90 mg. per kg. body weight, intraperitoneally). The animals were exsanguinated and the livers were removed and weighed immediately. Portions of right and left lobes were taken for histological examination ; the remainder was re-weighed and the total liver lipids were determined (Best, Lucas, Patterson, and Ridout, 1946). Blocks of liver, kidney, and certain other tissues were fixed in Heidenhain's SUSA mixture for 24 to 48 hours. Paraffin sections were stained with haematoxylin and eosin, and, to demonstrate connective tissue, with azocarmine, aniline blue, and orange G. The degree of fatty vacuolation of the liver cells was recorded as 0, +, ++, +++, or ++++. These histological data were in agreement with the results of chemical determinations, and therefore only the latter are included in the Table. Numerous sections from each liver were examined carefully for signs of fibrous-tissue proliferation.

Results

No abnormalities were detected on gross, microscopical, or chemical examination of the livers of any of the animals receiving the diets containing the lipotropic supplements, whether or not alcohol (or extra sugar, isocaloric with the alcohol) had been consumed. The rats maintained on the basal diet alone (Group 0) grew well and (with the exception of one rat which showed some pancreatic disease) the total liver lipids ranged from 7.7% to 12.8% with an average of 9.3%, and no liver fibrosis was observed. The average daily food consumption of the rats allowed to eat this diet *ad libitum* was reasonably constant at about 14 to 15 g., as was that of the other rats not consuming alcohol and eating *ad libitum* (Groups 1 and 9). All the rats consuming alcohol (Groups 2, 5, 8, and 10) ate less—only about 11 g. daily. The rats in the pair-fed groups (3, 4, 6, 7, and 11) were therefore offered 11 g. of the corresponding diets daily. The rats of Group 3 gained less weight because of this restricted food intake, but their livers showed essentially the same chemical and histological picture as those of the rats of Group 0.

The rats consuming alcohol without adequate lipotropic factors in the diet (Group 2) developed fatty livers with an average total lipid content (20%) about double that of the rats consuming the same amount of diet without alcohol (Group 3). One-half of the surviving rats drinking alcohol and eating the basal diet (Group 2) exhibited hepatic fibrosis, while in those without alcohol (Group 3) fibrosis could be detected in only two out of 28 survivors, and in one of these the fibrosis was minimal. The rats fed sugar isocalorically—i.e., those of Group 4—had on the average more fat (26%) in their livers and a somewhat higher incidence of fibrosis (7 out of 9 survivors) than those receiving the alcohol (Group 2). However, in none of the livers of either Group 2 or Group 4 had the fibrosis advanced sufficiently to be considered frank cirrhosis. The greater production of fibrosis in the rats of Group 4 (sucrose) than in those of Group 2 (alcohol) probably may be explained by our failure to achieve an exact equivalence in calories between the rats of these two groups. Some evidence for this is apparent in Chart I, in which it will be noted that the average final weight of the rats receiving the sugar supplement exceeded by about 16 g. that of the rats consuming alcohol. This is a rather small discrepancy in weight at the end of a test period of six months, but the difference it represents in calorie intake may be sufficient to account for the slightly greater liver damage. Chart II indicates a more successful attempt at pair-feeding in the rats receiving choline. The curves require no further comment except that the dips seen in all of

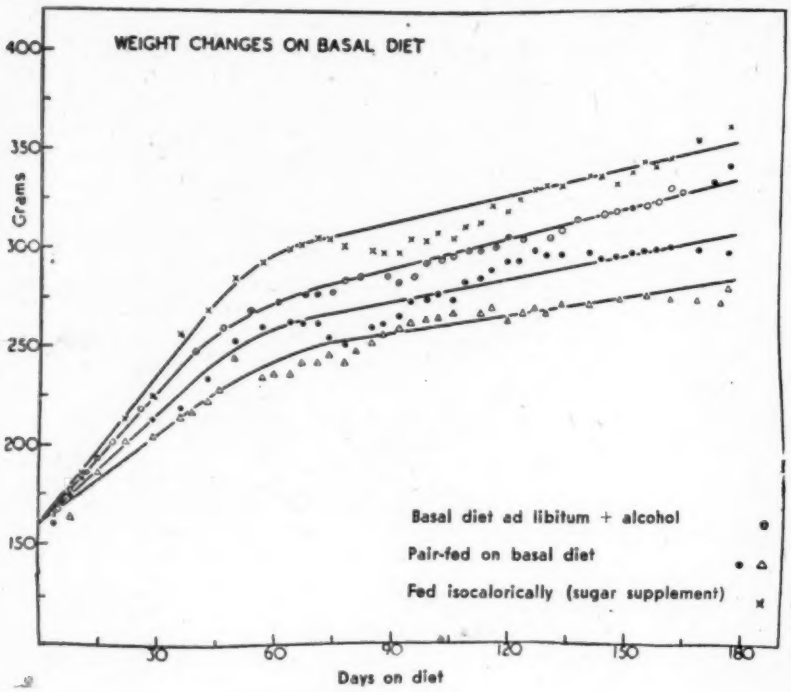

CHART I

them at about 80 to 90 days are related to a period of exceedingly hot weather, during which the air-conditioning equipment failed to function properly. Since the growth curves of the animals given supplements of methionine or casein (Groups 7, 8, 10, and 11) are essentially the same as those in Chart II, they will not be presented. The rats of Group 0 (basal diet *ad libitum*) grew most rapidly, those of Groups 1 and 9 only slightly less well. The rats of Group 0 consuming 14.9 g. of food per day (65 calories) gained on the average 262 g. Those of Group 3 consuming 11.2 g. (49 calories) of the same diet gained only 137 g. Rats of Group 2 eating essentially the same amount (11.4 g.) of diet but obtaining also 11 calories from alcohol—i.e., a total of 61 calories per day, 18% of which came from alcohol—gained 182 g. Rats of Group 4 ate 11.2 g. of diet daily and were given an average sugar supplement of 2.7 g. (total calories 60, of which 18% was supplied by the sucrose supplement); they gained 198 g. Thus rats of Group 0 eating 3.5 g. more food per day than those of Group 2

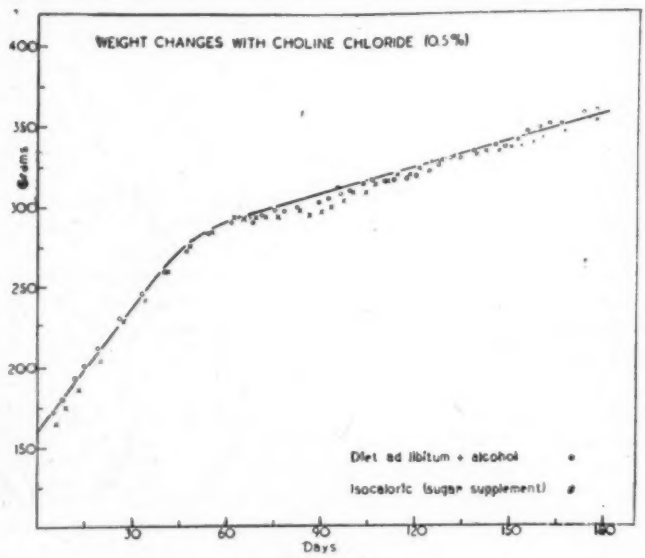

CHART II

gained 80 g. more than did the latter; in spite of the calories obtained by the rats of Group 2 from the alcohol, they were still getting from 4 to 5 calories per day less than those eating the basal diet *ad libitum*. The stunting of growth frequently attributed to the toxic action of alcohol is in these experiments due mainly to decreased food intake, unless one is willing to make the highly improbable assumption that sucrose exerts the same toxic effect as alcohol.

Fig. 1 (Plate) shows the typical histological picture seen in fatty livers (without fibrosis) of the rats consuming the basal diet with alcohol; Fig. 2 shows the same for rats on the basal diet with sugar fed isocalorically; Figs. 3 and 4 illustrate the distribution of fibrous tissue (when present) in the livers of the two groups. After careful study of many sections from all the livers these two examples were selected as representative of the two groups. The similarity in fat deposition and in the nature and extent of the fibrosis in the livers of the two groups is remarkable. Equally striking is the absence of abnormalities in the livers of the animals receiving adequate lipotropic supplements, as has already been mentioned.

Discussion

Clinicians in North America and Europe have tended for many years to associate chronic alcoholism and cirrhosis. In parts of Asia and Africa, however, cirrhosis is common although alcoholism is rare. In these regions it has been noted that cirrhosis occurs most often in persons subsisting on deficient diets. Thus a consideration of the incidence of cirrhosis throughout the world reveals a correlation with malnutrition. This situation may be obscured in some areas by a high incidence of cirrhotic changes following various forms of hepatitis. Within recent years it has been recognized that the chronic alcoholic, like other malnourished individuals, often shows signs of various dietary deficiencies: the intakes of good proteins and of vitamins of the B complex are generally low.

We are not considering in this paper the effects of alcohol on tissues other than the liver. Whether or not alcoholic beverages *per se* directly injure the liver has been a subject of controversy. Even if it could be proved that these beverages do exert a toxic effect upon the liver it would still have to be shown whether the effects were due to pure ethanol, to associated toxic contaminants, to a general malnutrition, or to one or more specific dietary deficiencies.

The present series of experiments does not supply any information whatever on the possible effects of toxic agents which may occur as natural contaminants of alcoholic beverages available in commerce. However, fatty infiltration and consequent fibrosis, which closely resemble the lesions in the chronic alcoholic, have been seen in these experimental animals consuming a purified alcohol. One is therefore tempted to assume that the hypothetical toxic contaminants may be of minor importance in causing the liver lesions seen in the human alcoholic.

The above experiments show that a carefully purified sample of ethanol can cause an excessive accumulation of fat in the liver and subsequent development of fibrosis when the diet lacks adequate amounts of the lipotropic factors. Since, however, pure sugar caused lesions of a similar nature and extent, and since these, as well as those due to alcohol, were entirely prevented by dietary choline or its

C. H. BEST, W. STANLEY HARTROFT, C. C. LUCAS, AND JESSIE H. RIDOUT: LIVER DAMAGE PRODUCED BY FEEDING ALCOHOL OR SUGAR, AND ITS PREVENTION BY CHOLINE

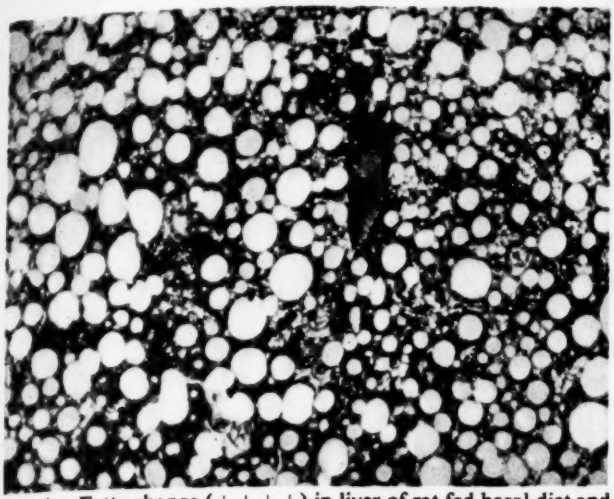

FIG. 1.—Fatty change (++++) in liver of rat fed basal diet and given 15% alcohol in place of drinking-water. Paraffin section; azocarmine, aniline blue, and orange G. (× 80.)

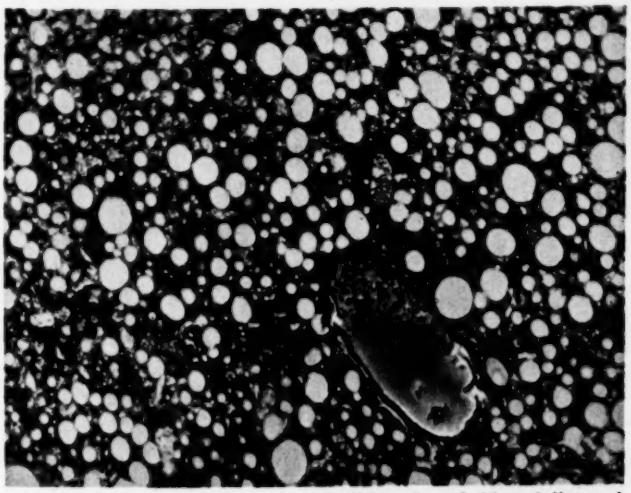

FIG. 2.—Fatty change (++++) in liver of rat fed basal diet and sugar. Paraffin section; stain as in Fig. 1. (× 80.)

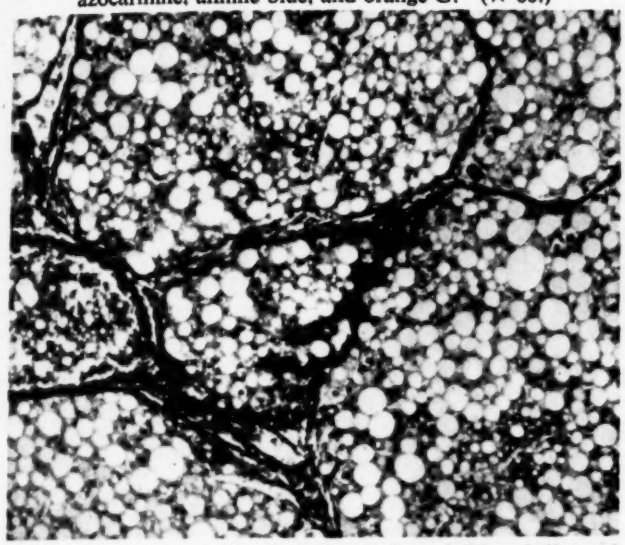

FIG. 3.—Well-defined fibrosis in liver of rat fed basal diet and given 15% alcohol in place of drinking-water. Paraffin section; stain as in Fig. 1. (× 80.)

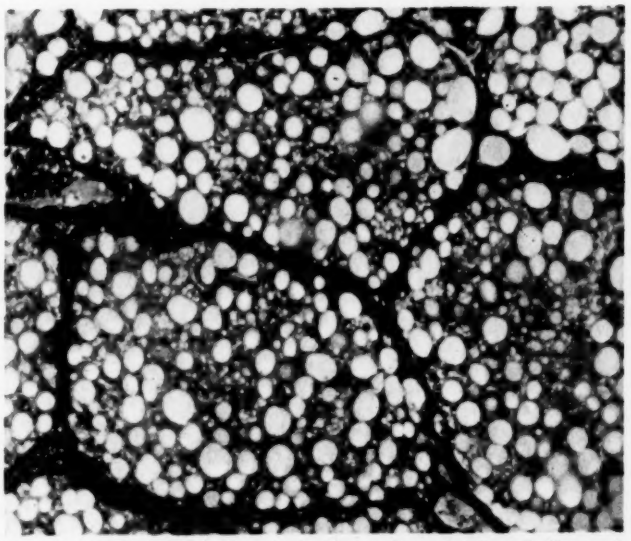

FIG. 4.—Well-defined fibrosis in liver of rat fed basal diet and sugar. Paraffin section; stain as in Fig. 1. (× 80.)

J. F. CURR: SYNOVIAL OSTEOCHONDROMATOSIS

FIG. 1.—Case 1. Right shoulder: large numbers of osteochondromata.

FIG. 2.—Case 1. New bone formation. (× 60.)

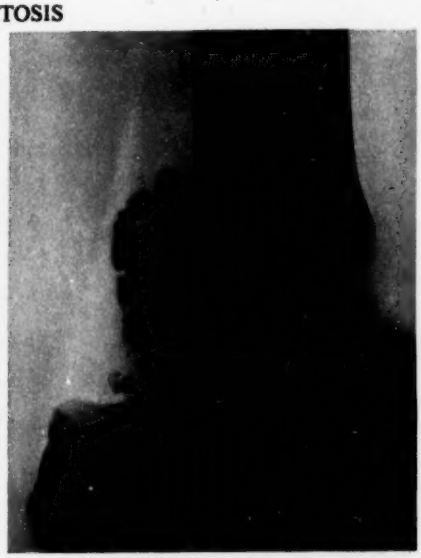

FIG. 3.—Case 2. Left ankle: osteochondromata posterior to joint.

J. H. PRAIN: FATAL POISONING OF AN INFANT BY ANTI-ANAEMIC PILLS CONTAINING IRON, MANGANESE AND COPPER

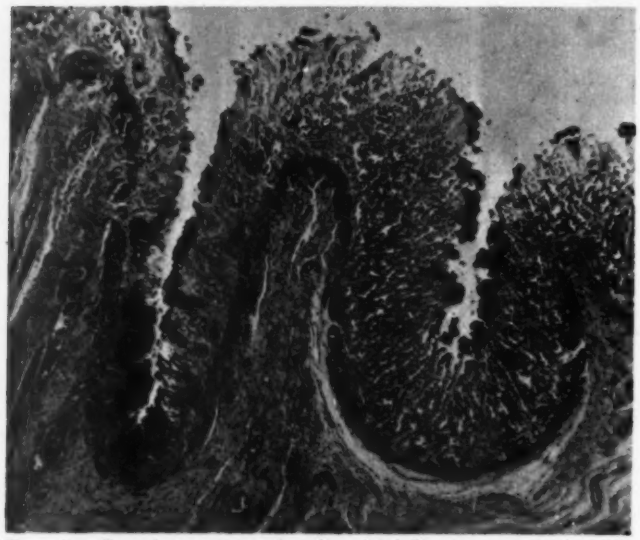

FIG. 1.—Gastric mucosa showing in left crypt necrosis with heavy impregnation by iron. In right crypt only surface layer is involved. Perles's method. (× 40.)

FIG. 2.—Damaged gastric mucosa showing impregnation of reticulum by iron. Perles's method. (× 80.)

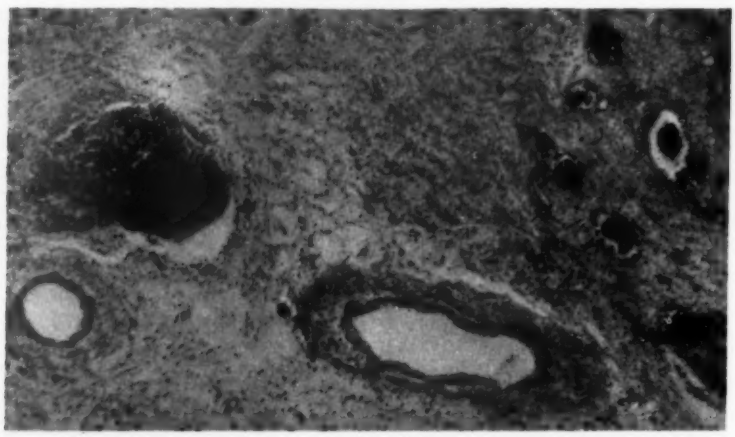

FIG. 3.—Thrombosis in veins of submucosa. Phloxine-tartrazine. (× 65.)

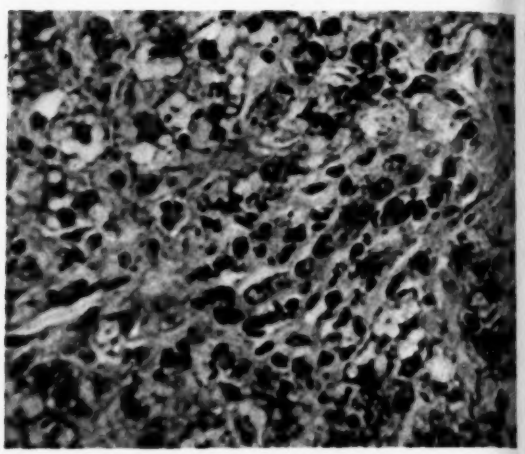

FIG. 4.—Liver showing fatty ballooning of cells. Celestin blue. (× 170.)

D. P. DEGENHARDT AND D. SHEEHAN: MULTIPLE MYELOMA

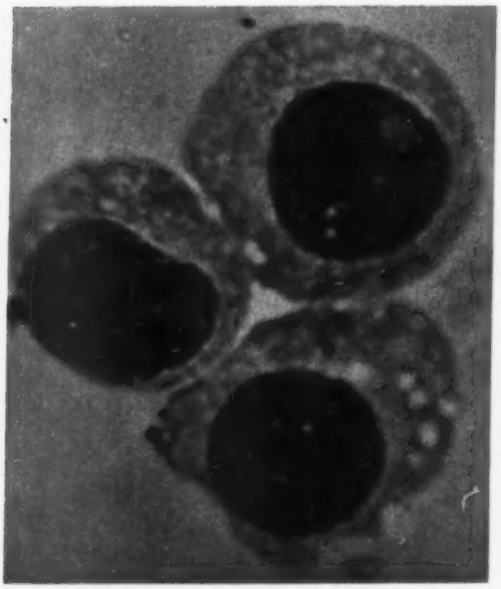

FIG. 1.—Case 5. Myeloma cells with scanty cytoplasm, vacuoles, and less densely staining nuclei with nucleoli. (1/12 objective.)

FIG. 2.—Case 6. Atypical myeloma cells with scanty cytoplasm. (1/12 objective.)

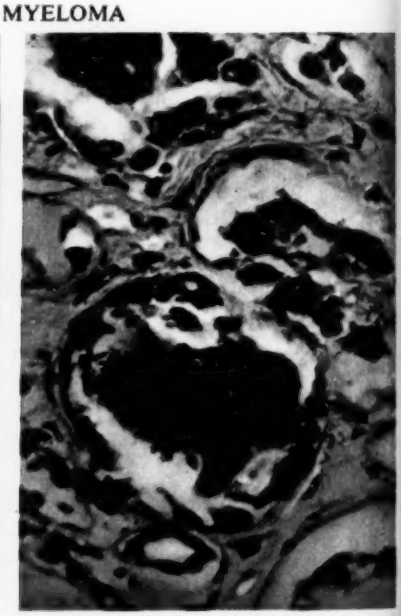

FIG. 3.—Case 4. Section of kidney showing blocking of tubules with eosinophil material and increase of interstitial tissue. (2/3 objective.)

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precursors (methionine or casein), the idea of a specific toxic effect of alcohol upon the liver cells receives no support. While the effects of general malnutrition should not be minimized, the experimental evidence establishes the fact that a specific dietary deficiency—viz., of choline—is involved in the production of the liver damage which we have observed.

Many of the older experiments, as well as some of the more recent ones in which the role of alcohol in the aetiology of liver damage was studied, were poorly controlled. When dogs, cats, rats, or other small animals are given such large doses of alcohol by stomach-tube that they are in a comatose condition during most of the time, the food consumption is inevitably low. Stunting of growth or loss of weight could be thus explained, and possibly also certain types of liver damage. In some other studies that have been reported the experimental animals were offered diets which were inadequate in many respects. To what extent multiple dietary deficiencies have influenced the effects of the alcohol in these experiments cannot be determined. The diet used in our investigation has been designed to be adequate (in terms of present knowledge) with regard to all the essential amino-acids, all available vitamins, minerals, and essential fatty acids. In other words, the diet is believed to be satisfactory in all respects except in the amount of lipotropic factors. When this basal diet was adequately supplemented with choline chloride good growth (slightly better than 3 g. per day) occurred. Further, the diet was designed to avoid an excessive accumulation of fat in the liver, since, as was mentioned earlier, it would be impossible to assess the effects of alcohol upon liver fat if they were superimposed on a liver made excessively fatty by the basal diet. The failure of some investigators to observe this precaution makes it difficult to interpret their data.

We do not agree that Ashworth's findings indicate that alcohol exerts a specific toxic action on liver cells. He reported that rats consuming high-casein diets showed fatty changes in the liver when given alcohol and that pair-fed controls did not. It may be noted that both groups of his rats lost weight. In the control rats this weight loss was probably due to their food intake being restricted to that of the rats given alcohol. It should be noted, however, that part of the weight loss might be explained by the absence from the diet of some of the B vitamins. It is now well known that the requirement for lipotropic agents diminishes as food intake is restricted, whether this restriction is imposed deliberately or whether it results from a deficiency of one or more vitamins. Thus it is not surprising that the livers of his control rats consuming the high-casein diet were not fatty. However, the rats given alcohol received more calories and lost less weight, but obtained no more dietary lipotropic factors than did the pair-fed controls. The increased requirement for lipotropic substances in this group is shown by the fatty changes in the liver which were found in all these animals. Thus, it is unnecessary to invoke any specific effect of alcohol to account for these results. They are presumably due to a relative deficiency of the lipotropic factors.

In the present experiments the character and distribution of the pre-cirrhotic lesion found in the rats ingesting alcohol differed in no way from that seen in the animals which received isocaloric amounts of sugar. Chaikoff and Connor (1940) stated that the diffuse character of the hepatic fibrosis produced in dogs by dietary means differed in type from that which they had previously described (Chaikoff and Connor, 1938) in dogs receiving alcohol. The photomicrographs published by them suggest to us that they may have been comparing different stages of the same type of lesion in their two groups of dogs. We agree with Lowry, Daft, Sebrell, Ashburn, and Lillie (1941) that alcohol aggravates dietary cirrhosis without altering the type or distribution of the fibrous tissue.

The importance of dietary factors in the prevention and treatment of liver cirrhosis has been discussed by many writers in recent years. The views expressed recently by Patek (1947) and Himsworth (1948) are supported and extended by the experimental studies which are here reported.

It is obvious that choline and other essentials should be supplied as naturally occurring components of a well-balanced diet, but the dietary faddist, alcoholic, or "soft-drink" addict does not consume this normal diet. One possibility, therefore, is to add choline or one of its precursors to alcoholic or saccharine* beverages which some individuals use to provide a large part of their calorie intake. As indicated above, the diet of the alcoholic is usually deficient not only in the lipotropic substances but also in other vitamins, and indeed in all essential food factors. The proposed fortification of these beverages with choline (or precursors), while protecting the liver against cirrhosis, would doubtless aggravate lesions due to deficiencies of other vitamins. This suggestion raises scientific, moral, financial, and gustatory problems which are far beyond the scope of this communication. Some preliminary studies of the effect of the lipotropic agents on the taste of various beverages have already been made, but we do not contemplate carrying out a comprehensive investigation of this matter. The necessary researches on the gustatory problems are relatively simple and do not lack interesting features.

Summary and Conclusions

In these experiments on white rats there is no more evidence of a specific toxic effect of pure ethyl alcohol upon liver cells than there is for one due to sugar. This conclusion is based upon the observation that dietary supplements of sucrose cause hepatic lesions (fatty changes and fibrosis) so similar in character and extent to those produced by an isocaloric amount of alcohol that they are indistinguishable.

The results suggest that an imbalance between calorie intake and supply of accessory food factors is the cause of the liver lesions: the extra calorie intake induces a specific deficiency when the basal diet is marginal with respect to any one vitamin. Alcohol or sugar, when taken in excess, supplants choline-containing foodstuffs and at the same time, by increasing the calorie intake, augments the demand for the lipotropic agents.

A mildly hypolipotropic diet is described which allows good growth of young adult male rats and maintains the total liver lipids at about 10% of the fresh tissue weight. This permits the study of the effects of alcohol upon the liver without complications due to multiple dietary deficiencies or to excessive deposition of liver fat resulting from the basal diet alone.

Rats eating this diet *ad libitum* and consuming 15% (v/v) solution of pure ethyl alcohol in place of drinking-water for six months develop fatty livers, and about one-half of them show pre-cirrhotic fibrosis.

An adequate supply of dietary choline or its precursor methionine (either free or in casein) protects the liver; neither excessive deposition of lipids nor fibrosis could be detected in any of the rats receiving lipotropic supplements.

Since the usual vitamins are present in the basal diet in more than adequate amount, and since the lesions are prevented by extra choline, the conclusion may be drawn that the hepatic changes associated with the ingestion of pure ethyl alcohol in this experiment are due to an induced choline deficiency.

*The word used here, "saccharine," it may be unnecessary to note, is the English adjective meaning sweet; it should not be confused with the trade name "Saccharin" applied to the sweet-tasting aromatic compound *o*-sulphobenzimide.

Problems connected with the proposal to supplement alcoholic beverages and saccharine aerated water ("soft drinks") with choline or its precursors are mentioned.

Our findings are, of course, not necessarily applicable to alcoholism in human subjects. If they should prove to be so, it is increasingly obvious that individuals who habitually consume large amounts of alcohol or sugar lack adequate amounts of the lipotropic agents as well as of other dietary essentials.

The classical hepatic lesions (fatty changes and fibrosis) associated with alcoholism in human subjects, the first descriptions of which are mentioned in our introduction, may prove to be due specifically to a lack of the lipotropic agents.

This work has been supported by the Nutrition Foundation of New York and the Banting Research Foundation, Toronto. We are indebted to our colleague Dr. Jean Patterson for her invaluable help. The photomicrographs were prepared by one of the authors (W.S.H.) with the technical assistance of Mrs. K. M. Robertson.

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THE PRE-ERYTHROCYTIC STAGE OF PLASMODIUM FALCIPARUM

A PRELIMINARY NOTE

BY

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The demonstration of a pre-erythrocytic cycle in mammalian malaria as it exists in the monkey malaria parasite, *Plasmodium cynomolgi* (Shortt and Garnham, 1948), led to the deduction that a similar cycle would be found in the case of human malaria caused by the parasite *P. vivax*. This followed from the close similarity of the two parasites, and the assumption was quickly proved experimentally by the discovery of the pre-erythrocytic cycle in a human volunteer (Shortt, Garnham, Covell, and Shute, 1948). In both cases the pre-erythrocytic cycle was shown to take place in the parenchyma cells of the liver.

It was subsequently demonstrated that this cycle persisted in the liver after the establishment of the infection in the peripheral blood and that it was the probable cause of relapses in benign tertian malaria, since it could exist in the absence of the erythrocytic cycle.

The work of Fairley (1945, 1947) showed conclusively that in both vivax and falciparum malaria there was a cryptic phase in infections caused by mosquito bites during which pre-erythrocytic development must have been proceeding in some situation other than the blood stream. No other conclusion could be drawn from the results of his experiments, and he established the approximate duration of this cryptic phase as eight days in the case of vivax malaria and six days in the case of falciparum malaria.

As already stated above, the truth of this assumption had been established in the case of vivax malaria, but similar proof was still lacking in the case of falciparum malaria, and it was to obtain this that the experiment which is the subject of this paper was carried out.

Unlike the case in vivax malaria, we were unable to argue from monkey to man, since no suitable monkey parasite closely similar to *P. falciparum* was available for study, and a human experiment was necessary without any preliminary comparative work.

The fact that *P. falciparum* shows considerable differences in its morphology and life cycle from *P. vivax* at least raised the possibility that there might be certain differences in the nature of the cryptic stage as compared with those of *P. vivax* and *P. cynomolgi*, as well as in the site in the body where it occurred. It seemed probable, also, if we accept the persisting exo-erythrocytic cycle as the source of relapses in vivax malaria, that, although there would be a pre-erythrocytic cycle in falciparum malaria, it would be short-lived and end with establishment of the erythrocytic infection. This is a natural deduction from the well-known fact, so conclusively proved by Fairley's experiments alluded to above, that complete eradication of the erythrocytic infection in falciparum malaria ends the disease and relapses do not occur. This made the problem of choosing the correct day for the biopsy on the volunteer of great importance, as will be seen when the details of the experiment are described.

Description of Experiment

Anopheline mosquitoes of the species *A. maculipennis atroparvus* and *A. quadrimaculatus* were infected by feeding on two occasions on a subject carrying in his blood large numbers of gametocytes of a Rumanian strain of *P. falciparum*. These were maintained on blood meals for fourteen days, and mosquitoes were dissected and examined daily to follow the progress of the infection. These dissections revealed an infection rate of 93%. After ten days the dissections showed that the salivary glands had been invaded, and it was considered that four days afterwards would be the optimum time to feed them on the volunteer.

This operation was carried out on three days as follows, a total of 770 bites by the mosquitoes being recorded.

On October 10, 1949, 350 mosquitoes fed ; on October 11, 95 fed, these being the mosquitoes that had failed to feed on the first day. On October 12, 325 fed : the majority of these were the mosquitoes of the first day of feeding having a second blood meal on the volunteer.

The dissections referred to had shown that 93% of the mosquitoes were infected and that the infections in the salivary glands were extremely heavy, so that the dosage of sporozoites injected by the 770 bites must have been enormous.

After a full consideration of all the factors involved, and influenced chiefly by the duration of the incubation period

in falciparum malaria after infection by mosquitoes as exemplified in Fairley's work already alluded to, we decided to perform a biopsy and remove a piece of liver from the volunteer by open operation 140 hours after the initial feed of the mosquitoes. This implied the assumption, later proved to be correct, that the exo-erythrocytic stages would be found in the liver as in the cases of *P. cynomolgi* and *P. vivax*. As the mosquitoes had fed on three successive days, it will be evident that the hypothetical pre-erythrocytic forms at the time of the biopsy would be at three different stages of development separated by approximately 24-hour intervals. At the operation, performed by Mr. C. Naunton Morgan, a wedge-shaped piece of liver measuring about 1 in. by ¾ in. by ½ in. (2.5 by 1.9 by 1.25 cm.) was removed. This was divided into pieces of appropriate size and fixed in Carnoy's fluid. Sections cut from this material were stained by the colophonium–Giemsa method (Shortt and Cooper, 1948).

Microscopical Examination of the Sections

In the liver sections were found pre-erythrocytic schizogony forms of *P. falciparum* very similar to those of *P. cynomolgi* and *P. vivax* but with differences noted below.

As expected, three stages have been found. The most advanced forms probably correspond to those initiated on the first day of infection by the mosquitoes, and were approximately 140 hours old; the second correspond to the second day of infection, and were approximately 116 hours old; while the least-advanced correspond to the third day of infection, and were approximately 92 hours old.

It must not be supposed that the examples of these three stages were all sharply differentiated in their degree of development, since there were two infection periods, separated by several hours, on each of the days in which the infecting mosquitoes fed, and this was responsible for some grading in the degree of development of the schizonts without materially affecting the differentiation of the forms found in the three stages corresponding to the three "infection" days. All appeared to be contained in the parenchyma cells of the liver.

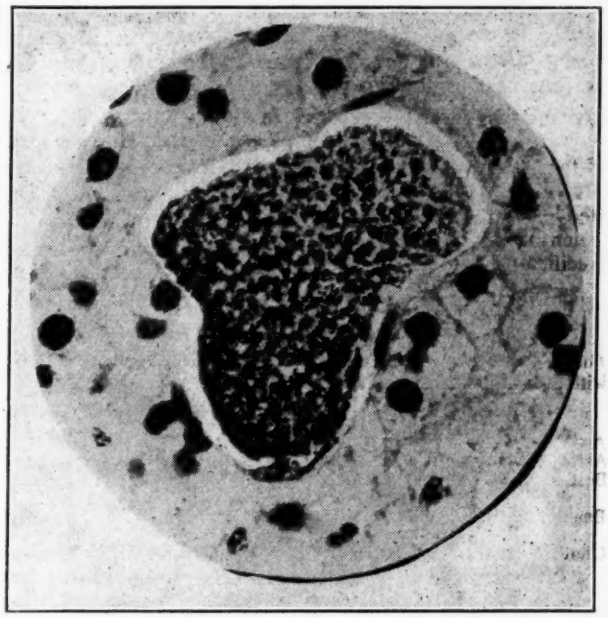

FIG. 2.—Five-day-old pre-erythrocytic stage of *P. falciparum* in human liver (× 700).

Forms 140 Hours Old.—In these forms, which measured up to 60 μ or more in length by about 30 μ in width, the merozoites were already formed and the schizonts ready to rupture or already in process of rupturing and releasing the merozoites into the surrounding sinusoids. The cytoplasm of the schizonts stained a blue or blue-mauve colour and the nuclei or chromatin masses a reddish magenta. The shape of the schizonts varied from ovoid to lobose. In some cases, however, an apparent membrane was present the source of which seems obscure. The merozoites were very small, measuring about 0.7 μ across, and extremely numerous.

Forms 116 Hours Old.—Until a very lengthy and detailed examination of our material has been made it will

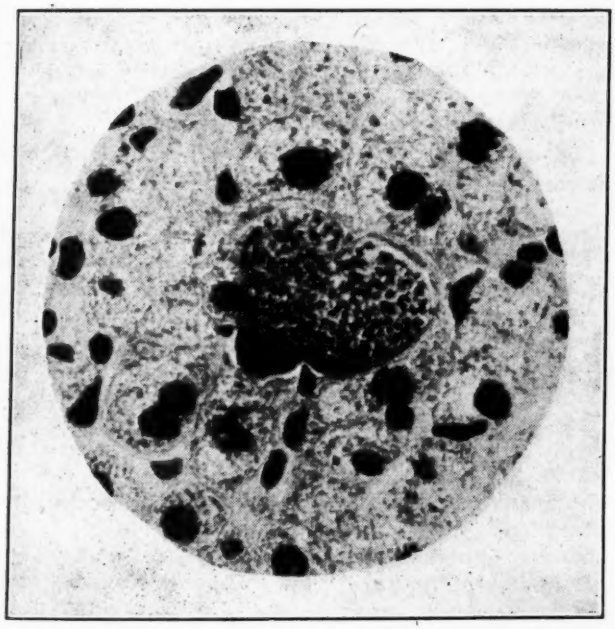

FIG. 1.—Four-day-old pre-erythrocytic stage of *P. falciparum* in human liver (× 700).

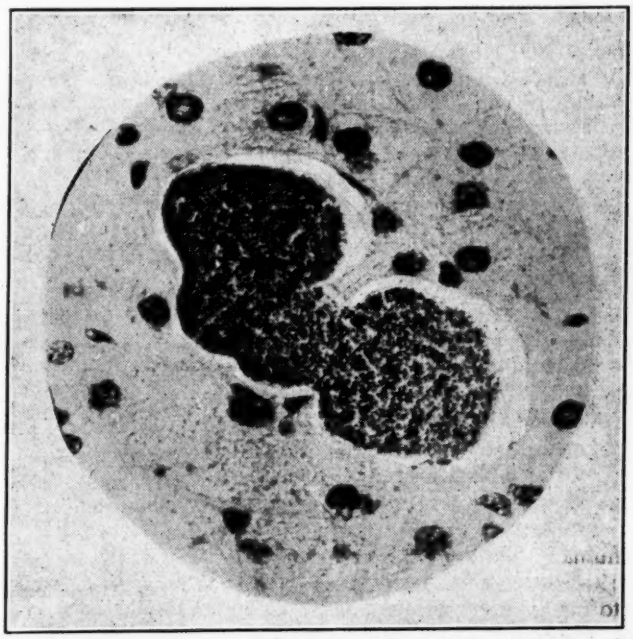

FIG. 3.—Six-day-old pre-erythrocytic stage of *P. falciparum* in human liver (× 700).

not be possible accurately to date the forms younger than the fully developed schizonts ready to rupture. In all the younger forms the nuclei were larger but much less numerous and the cytoplasm more abundant, the staining reactions remaining the same. The schizonts, which were ovoid or bluntly lobose in shape, were not quite so large as in the previous stage, but a large example would measure about 50 μ by 36 μ in the long and short diameters. This would probably represent a late fifth-day form.

Forms 92 Hours Old.—The schizonts were considerably smaller than the previous form, measuring about 31 μ by 26 μ in their longer and shorter diameters. They tended to be ovoid in shape, but lobose forms or forms constricted in the middle were already appearing. The blue cytoplasm was coarsely granular and the nuclei were much less numerous than in the previous stage. As in the cases of *P. cynomolgi* and *P. vivax*, there was no cellular reaction to the presence of the parasitic bodies in the liver tissue in any of the three stages described.

Comment

In comparing the various stages described with those found in *P. cynomolgi* and *P. vivax* it will be evident that the pre-erythrocytic forms of all three species are closely similar. Points of difference are the larger size of the mature schizont of *P. falciparum*, the smaller size of the merozoites, and the much greater number of these in the schizonts. The full maturity of the schizonts in less than six days proves that schizogony in the pre-erythrocytic forms of *P. falciparum* proceeds much more rapidly than in either *P. cynomolgi* or *P. vivax*.

The general impression gained, however, is that the three species must be considered closely related and that the genus *Plasmodium*, as exemplified in these three species whose essentially complete life cycles are now known, is a compactly knit entity the members of which conform closely to the generic pattern.

Summary

For the first time the existence of a pre-erythrocytic stage in the life cycle of *P. falciparum* has been demonstrated and the forms at three stages of development are briefly described.

We express our great indebtedness to many helpers who have assisted at various stages in the carrying out of this successful experiment. Our special thanks are due to Mr. C. Naunton Morgan, who performed the open operation on the liver with remarkable skill and celerity, to Dr. C. Langton Hewer, who gave up valuable time to administer the anaesthetic to the volunteer, and to the staff of the Hospital for Tropical Diseases for their assistance and care throughout the experiment. Dr. W. D. Nicol, physician superintendent of Horton Hospital, has earned our gratitude by granting the most ample facilities for the initial infection of the mosquitoes at Epsom and their subsequent use on the human volunteer. Mr. W. Cooper, chief technician, Miss Maryon, and Mrs. P. Lee gave invaluable and skilled assistance and spared neither time nor trouble in many tedious technical operations. The one indispensable actor in the piece was the human volunteer, Mr. C. H. Howard, who not only cheerfully, but on his own initiative, offered himself for this experiment and thereby helped greatly to advance scientific knowledge on an important aspect of malariology.

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REHABILITATION AND RESETTLEMENT OF THE TUBERCULOUS*

BY

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In all matters concerning the resettlement and rehabilitation of the tuberculous three factors are of paramount importance. The first is that it is impossible to be sure that a tuberculous person has completely recovered from his disability; the second is that there are no means of assessing a tuberculous person's capacity for work except by trial and error; and the third is that when the disease is active it is usually infectious. These three factors differentiate the problem of other disabled persons from that of the tuberculous and make it necessary to have special schemes to meet the requirements of the latter group. I propose to examine in more detail the three factors with special reference to resettlement and rehabilitation.

1. Uncertainty about Recovery

It is not easy to find reliable statistics on the relapse rate of those who have been treated in sanatoria. There are many reports on the post-sanatorium mortality rate which are helpful, but these do not indicate the amount of chronic invalidism amongst the tuberculous population. Here are some conclusions taken from studies of after-histories of patients.

Bashford and Scott (1936) in their report on the health of 3,755 Post Office workers state: "Of those who incur pulmonary tuberculosis not more than 50% are able to return to work even after prolonged periods of treatment, and of those who return there has been a further wastage of about 48% as a result of recurrent pulmonary tuberculosis, or other form of ill-health, by the end of ten years, the heaviest wastage having occurred in the first six years."

Tattersall (1949), in a five-year follow-up of sputum-positive cases, found that 10% of the "recovered" cases deteriorated after an average period of six years as "recovered." He suggests that a patient whose working capacity is reduced by phthisis is not always a short-term social liability, and that it is doubtful if there is any justification in discharging from supervision any tuberculous person who has had a positive sputum.

Such information, although emphasizing the need for special measures for rehabilitating the tuberculous, is not particularly encouraging, and it would be as well at this point to inquire why the tuberculous relapse and die. A satisfactory answer to this query cannot be given; all that can be said is that certain conditions predispose to activity of the disease. Which of these conditions is the most important varies from individual to individual. Undernutrition, overstrain, anxiety, acute respiratory infections, insufficient rest, and certain occupational conditions are factors that influence the state of the lesion, and the facts may be summarized in a brief but vague way by saying that anything that lowers the resistance of the body to infection will increase the possibility of a breakdown from tuberculosis. This is really begging the question, as resistance is a term which cannot be defined. The inability of the body to rid itself of the tubercle bacillus is well known, and he would be a bold man who said that in any arrested

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case of tuberculosis no live tubercle bacilli were to be found in the body. Careful examination of even calcified lesions often reveals the presence of living bacilli, and so long as they are there it is possible for activity to develop.

The experience of two great wars and studies of the mortality figures of tuberculosis in relation to environment have shown that when the standard of living falls tuberculosis rises. Thus the first principle in the resettlement of the tuberculous is that the standard of living of tuberculous persons must be kept high. The mortality rates during the last ten years in countries like Denmark, Sweden, and the U.S.A., where the tuberculosis death rates actually fell during the war years, show clearly the relationship of the national standard of nutrition to tuberculosis mortality rates, and recent figures published in *Tubercle* (1948) reveal a close connexion between protein intake and tuberculosis mortality. It is therefore essential in any tuberculosis resettlement scheme to be sure that a good standard of nutrition is maintained. Housing, food, and clothing are items that must take a prominent part in aftercare, and it is possible that in the effort to provide suitable work insufficient attention has been paid to these equally important items.

It is not difficult to appreciate the advantages which the village settlement affords with regard to post-sanatorium medical supervision and provision of the most favourable environment for tuberculous persons, but there are many who cannot or will not be admitted to these institutions. For these it is proposed that the necessary medical supervision and the opportunity for rest, nourishment, and regulated life shall be provided by the night sanatorium. This institution should accommodate from 30 to 50 tuberculous persons who have completed or nearly completed their sanatorium treatment and are fit for three or more hours' industrial employment, preferably in special factories under the Disabled Persons Employment Corporation.

Priority of admission will be given to positive cases, and particularly to those who have unsatisfactory homes or no homes at all. It is anticipated that night sanatoria will enable patients to be discharged from institutional treatment at an earlier date than if they had to return home, and they will permit the discharge of patients who are now retained in sanatoria owing to home conditions. In this way they will relieve the bed situation without increasing the nursing shortage.

For the patient the night sanatorium provides a safe means of returning to industrial work by lessening the break between the rural environment of the sanatorium and the crowded conditions of the city dwelling. It also enables the patient to continue treatment in an environment that he appreciates and is generally longing to return to whilst under treatment in the country.

Rehabilitation is not merely a matter of providing suitable work for the disabled. The unstable condition of many tuberculous workers demands routine medical examination, including radiography and a careful search for the tubercle bacillus. This is particularly necessary after catarrhal colds or influenzal symptoms. Even in long-term arrested cases a yearly check is most desirable. This means close co-operation between resettlement schemes and the chest clinics of the regional hospital boards, or rehabilitation centres will need to have their own clinics attached to the industries. Careful record-keeping at chest clinics will be necessary if the value of rehabilitation schemes is to be judged, for at present there is no statistical evidence that persons at village settlements do any better in the long run than clinically comparable cases under good domiciliary conditions, particularly if an equal amount of money and care is spent on them.

2. Assessment of Capacity for Work

That overstrain can cause a quiescent lesion to become active has been recognized for many years, and if such activity is not treated a serious breakdown in health will occur. At present only by giving a man a certain job is it possible to determine if he is capable of working. The practice, therefore, is to begin with short hours on light work, and, if the man remains healthy and shows no signs or symptoms of active disease, to increase the amount of work periodically. This method is unscientific, and, although some valuable pioneer work has been done by Brieger at Papworth, we are still a long way from solving this important problem of rehabilitation. It is necessary for the physiologist, the biochemist, and the psychologist to pool their services for research into this matter.

It can be stated that certain occupations are unsuitable for tuberculous persons, and on this point I would like to emphasize that practically all outdoor jobs are unsatisfactory for the tuberculous on account of the fatigue and exposure they involve. Other occupations that are contraindicated are the dusty trades and those involving irritating fumes, and especially those harmful dusts containing silica, as well as trades demanding work in conditions of high relative humidity or extremes of temperature. Heavy muscular work and high-pressure team-work are also undesirable. These restrictions, based on observation of the behaviour of tuberculous persons who have tried working under such conditions, limit the range of employment to be recommended in a rehabilitation scheme. At Papworth and Preston Hall the following industries and occupations have been carried on with successful results: printing, woodwork, clerical work, leather work, fancy goods manufacture, light engineering, and tuberculosis nursing.

Of course a condition other than the man's physical fitness has to be considered, and that is his technical ability to do the work. Where a man has to change his occupation it is usually necessary to give him a long course of instruction before he can be of any economic value. At Preston Hall a scheme has been developed by which the man can not only be trained to do a particular job but can, if he wishes, be fully apprenticed to a trade, so that eventually he becomes a skilled workman with a comprehensive knowledge of his subject. Such training is essential for young men, but it is not usually acceptable to the more elderly. The incidence of tuberculosis is steadily rising in the older age groups in males. This will probably complicate resettlement schemes, as these elderly persons do not take kindly to village settlement life and are not keen on training for a new job, although their previous occupation is often not very suitable. It is probable that the Remploy factories of the Disabled Persons Employment Corporation will be a great help to these people in the future.

The amount of work tuberculous persons can do even when their disease is arrested is usually less than that done by normal persons, and the rate at which they work is often slower. If they are employed on sanatorium staffs three tuberculous persons are needed to do the work that could be done by two normal persons. The only way to speed up production by tuberculous persons is to put them in charge of machines that do the work almost automatically and require the minimum of energy expenditure. Large amounts of capital are required to carry this out successfully and establish a productive industry. Failing this, the employment of the tuberculous is apt to develop into the nature of handicraft work which has little or no prospect

of providing a livelihood. In fact, over-concentration on handicraft work is one of the great obstacles to successful rehabilitation schemes. Unless the handicraft work is directly related to the type of work in which the patient will ultimately be trained, it is largely a waste of time and may easily create the invalid complex which prevents the man having the confidence to accept training in a trade by which he can be eventually self-supporting.

3. Danger of Infection when Disease is Active

There are two schools of thought on the infectivity of tuberculosis. One school believes that the development of active disease is determined mainly by the degree of inherent or native resistance, other important factors being the age at which primary infection occurs and the magnitude of the dose of the primary infection. If the primary infection is overcome it is thought that small reinfections tend to raise the general resistance to the disease so that active disease can occur only if the reinfecting dose is very large, and, as this is unlikely except under very close contact, it is argued that exogenous infection, other than the primary infection, plays only a small part in causing active disease in those already infected. Relapses are considered to be due to lowering of the resistance, which allows a spread of the lesion sometimes from a sudden bacillaemia arising from rupture of a tubercle into a blood vessel.

The other school puts much greater stress on the importance of exogenous infection and regards exposure even to small doses of the bacilli as dangerous. Although the evidence is by no means complete, it is probable that inherent resistance is the most important factor and that after the primary infection has been overcome only large and often-repeated exogenous infections are of any danger. If this is true it has a considerable bearing on the planning of rehabilitation schemes. It means that the tuberculous and non-tuberculous can be employed together without undue risk, provided the non-tuberculous have overcome their primary infection, are adequately nourished, have a good standard of living, and work under hygienic conditions. Tuberculosis will spread among them if any of these conditions are neglected. In other words, the soil is of more importance than the seed in preventing the spread of infection.

Even if such conclusions are correct it will be extremely difficult to apply them; for the general public have a great fear of tuberculosis, and we have to accept the fact that tuberculous persons are usually resented by their fellow workers, who always blame the known case for the development of the disease in any contact, whereas the fresh case may be entirely due to exacerbation of an old focus and have nothing to do with contact at all. Therefore, until more is known of the incidence of infection among the population and a less fearful attitude towards tuberculosis is established, it is wise not to have open positive cases in normal industry except in special circumstances that will satisfy the demands and calm the fears of the management and other employees.

Another difficulty that arises from the infectious nature of the disease is the possibility of products of the industry carrying the infection. Here again the danger is more imaginary than real, except where children are concerned, but there is evidence that woollens, furs, and books can retain the bacillus for a number of days. It is therefore unwise to teach tuberculous persons to make woollen or fur toys and children's play-mats, for, although these can be adequately sterilized when made under supervision, there is no such safeguard when the goods are made at the patient's home and sold privately. No fear of spreading the infection by polished wood or metal goods need be entertained, and there is no need to sterilize the usual products of printing, leather, or wood. But it is not good policy to employ tuberculous persons on any work connected with the preparation of food, and this includes the picking of fruits and gathering salad plants, although here again the risk has been exaggerated through repetition of unproved statements on the danger of infection.

Some day, when we have the courage to act on our convictions, this bogy of infection will be dispelled by making people realize that it is the inherent resistance to the disease that really matters once the primary infection has been overcome. If the public is to be educated along these lines we must begin by scrapping most of the pamphlets on the danger of infection and publish new ones based on recent advances in the pathogenesis of the disease.

Finance

The greatest difficulty of all in rehabilitation and resettlement is that of finance. It is best to be frank and recognize at the outset that the average tuberculous worker is a poor financial proposition to the employer unless there is capital to provide the special conditions under which he can work with safety and efficiency. In the Spero works in London, where an average of 62 mostly sputum-positive tuberculous persons are employed under sheltered conditions, there was a loss of 1,980 working days owing to sickness during 1947.

Although some of the persons employed in this special factory are severely disabled, the figures give an indication of the high liability involved in employing tuberculous persons without attention to living conditions. Nevertheless it is worth while providing sheltered employment for these people, who would otherwise lounge about the streets and their homes, living under the degenerating influence of enforced idleness. But in order to employ such precarious labour heavy financial assistance is needed to maintain a sufficiently high standard of living.

To enable him to live, a disabled tuberculous person can obtain the necessary financial assistance from various sources, depending on his clinical status. Whilst he is a patient his treatment will be free and he will be entitled to national health insurance benefit and a grant up to 20s. a week for any productive work. During post-sanatorium training and rehabilitation he may receive board and lodging, national health insurance benefit, and the grant up to 20s. per week for his productive effort. The Ministry of Labour and National Service has authority to contribute to the cost of the person's rehabilitation, and approved persons in training centres get a grant of 28s. per week for a maximum period of three years; they also receive free board and lodging if residing in a hostel in the village settlement.

Some of the larger local authorities have accepted financial liability for the maintenance of persons undergoing rehabilitation at industrial settlements as part of their obligations under Section 28 (3) of the National Health Service Act. It is possible, therefore, in such circumstances to assure the training and resettlement of a tuberculous person provided the contributions from the authorities mentioned continue. Where such assistance is not forthcoming it is difficult to arrange for adequate rehabilitation. A serious obstacle may arise in the development of rehabilitation schemes if local authorities take advantage of the permissive clause in Section 28 (2) whereby they may recover charges from a person receiving aftercare services, which it is presumed includes rehabilitation, having regard to the person's means.

Any suggestion of a means test at the stage when a subject is about to begin a course of rehabilitation will cause many to refuse to accept such services. Many chest physicians believe that rehabilitation is a part of treatment, and if this is free then rehabilitation should also be free. It is hoped that those responsible will realize that the harm that will be done by application of a means test and the collection of small sums from the disabled can never be compensated by the financial gain to public funds.

Summary

Three difficulties complicate the rehabilitation of the tuberculous: (1) it is impossible to be sure that a tuberculous person has completely recovered from his infection; (2) there are no means of assessing the tuberculous person's capacity for work, except by trial and error; and (3) persons with active tuberculosis are usually infectious.

Each of these difficulties is discussed, and suggestions are made for overcoming them. The financial problem is perhaps the most difficult to solve.

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PROSTATIC OBSTRUCTION*

BY

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Over a period of eight years 2,192 patients were admitted to my wards with symptoms due to non-malignant disease of the prostate, and of these 1,960 were submitted to prostatectomy, with an overall mortality from all causes, whether attributable to the operation or not, of 3.01%. In private cases the mortality was 1.96%. The following Table gives a detailed report on these results.

Results of Treatment of 2,192 Cases of Prostatic Obstruction (Non-malignant). 1,960 Cases Submitted to Prostatectomy, With a Mortality from All Causes of 3.01%; 44.9% Admitted with Acute Retention

	No. of Patients	Percentage of Total	No. with Acute Retention in Each Group	Mortality
Perurethral prostatectomy ..	1,347	61·4%	510 (37·8%)	41 (3·04%)
Suprapubic prostatectomy ..	613	27·9%	291 (47·5%)	18 (2·93%)
One-stage	363		143	12
Two-stage	250		148	6
Suprapubic cystostomy† ..	183	8·3%	135 (73·8%)	13%
No operation	49	2·2%	—	—

A patient aged 90 had a perurethral prostatectomy successfully performed. There was a consecutive series of 150 prostatectomies without a death.

† A number of these cases will be suitable for prostatectomy later.

Causes of Death following Prostatectomy

Cardiac failure ..	25	Malignant endocarditis	1
Coronary thrombosis		Cerebral abscess	1
Pulmonary embolism		Haematemesis	1
Uraemia	8	Cerebral tumour	1
Clot retention	5	Tetanus	1
Cerebral thrombosis ..	4	No records available	5
Shock and collapse ..	7		

During this period it was evident that doctors tended to send their good-risk cases to the voluntary hospital and their poor-risk cases to the municipal hospital. A surgeon working only at a voluntary hospital has therefore an unfair advantage so far as results are concerned. In the series here recorded the cases were admitted to both voluntary and municipal hospitals and to a nursing-home, and it is thus possible to judge the results of prostatic surgery carried out on a cross-section of the community.

The operations were performed by various routes—the perurethral, transvesical, and retropubic.

*Read in opening a discussion in the Section of Surgery at the Annual Meeting of the British Medical Association, Harrogate, 1949.

Acute Retention as a Result of Prostatic Obstruction

A man apparently in good health may suddenly and painfully be made aware that he suffers from a prostatic obstruction by the development of an acute retention, for which the doctor may be asked to see him for the first time. This apparent misfortune may be a blessing in disguise by directing attention to the need for radical treatment. The doctor's decision regarding the immediate treatment may profoundly influence the subsequent course of the illness. He has the choice of several methods of procedure, and I give the three best in order of preference: (A) Injection of morphine ¼ gr. (11 mg.) and immediate transportation of the case to hospital; (B) catheterization; (C) suprapubic aspiration.

(A) There is no doubt in my mind that this is the best course to adopt. The patient is immediately placed under the best conditions, and any procedure can be carried out with strict asepsis.

(B) If the patient is living in the country far from a hospital or is unfit for removal for any reason, then catheterization is permissible. The passage of a catheter should be regarded as of the same importance as a major operation. The dangers of catheterization are: (i) Trauma of the mucous membrane of the urethra, with the risk of opening venous sinuses; this may be followed by rigors and sepsis. (ii) Introduction of infection. (iii) Rapid decompression of the bladder with its attendant risks of suppression of urine and haemorrhage, particularly when an acute retention is superimposed upon a pre-existing chronic retention. (iv) Failure of catheterization.

The avoidance of trauma is of paramount importance. In the ordinary way the beak of the catheter loses its lubricant in the first part of the urethra and passes along the remainder unlubricated, and is apt to cause trauma. This difficulty can be overcome if the technique described below is carried out, and, moreover, failure of catheterization will be very rare indeed.

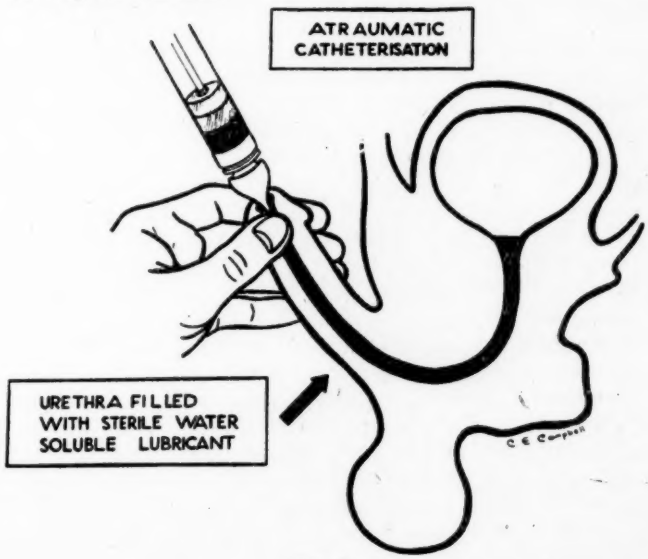

FIG. 1

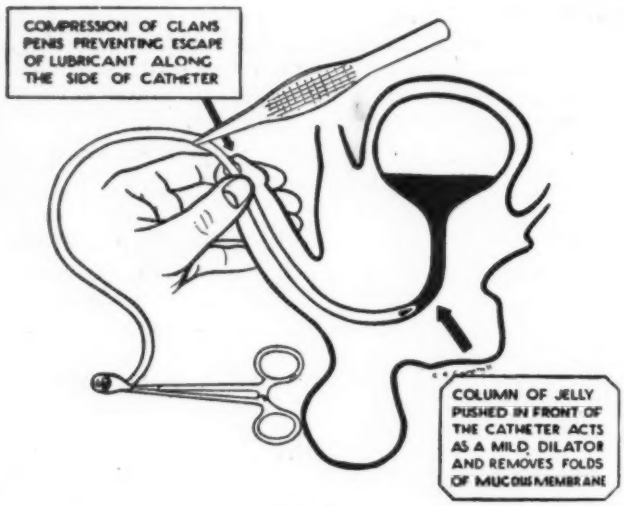
COMPRESSION OF GLANS PENIS PREVENTING ESCAPE OF LUBRICANT ALONG THE SIDE OF CATHETER
COLUMN OF JELLY PUSHED IN FRONT OF THE CATHETER ACTS AS A MILD DILATOR AND REMOVES FOLDS OF MUCOUS MEMBRANE

FIG. 2

About 10 ml. of sterile water-soluble lubricant is injected slowly into the urethra by means of a " record " syringe to which a rubber nozzle has been fitted (Fig. 1). The glans penis is compressed to prevent the jelly escaping. The beak of the catheter, the open end of which has been closed with artery forceps, is now introduced into the meatus and digital compression of the glans penis immediately reapplied (Fig. 2). The catheter is now advanced along the urethra, and, as an air-lock is present in the catheter as a result of closure of the end, a column of lubricant is pushed in front of the catheter. This acts as a dilator of the mucous membrane, removing any folds or light obstructions which may impede the passage of the catheter.

Repeated catheterization in these cases of retention in the hope that the patient will eventually pass urine should, except in special cases, have no place in modern treatment. Even though the congestion of the enlarged prostate should settle and the patient pass urine again, some degree of bladder-neck obstruction will persist. In due course a further retention will occur, or, if the patient is unlucky, he will live on in failing health until severe renal damage has occurred, with associated secondary cardiovascular changes. The doctor has thus merely postponed the evil day, and in the end the patient will face the operation in a poor state of health.

(C) The doctor should assure himself by percussion that the distended bladder is not intraperitoneal. After injection of a local analgesic with a fine needle into the midline of the abdominal wall a larger needle is inserted obliquely into the bladder, as illustrated in Fig. 3, and the urine from the bladder aspirated.

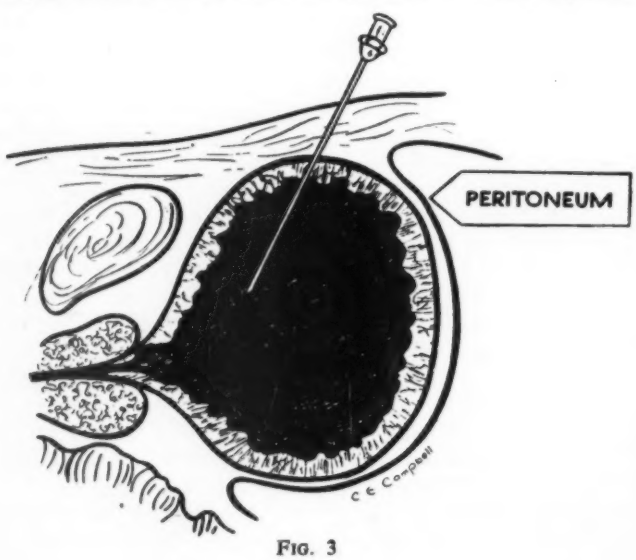

FIG. 3

The patient should then be admitted to hospital without delay.

Treatment of Acute Retention in Hospital

Three methods have been used in this series of cases. (i) After calibration of the urethra an indwelling Foley's catheter (18 Charrière gauge) was inserted by the technique described. The bladder was then decompressed. In this way an emergency operation subject to difficulties which could not always be foreseen, such as cancer of the bladder complicating the obstruction, was avoided, and time was allowed for a thorough investigation of the case and an improvement of the patient's renal function. (ii) Immediate prostatectomy was performed when the retention was complicated by the existence of a tight phimosis or other conditions which made the passage of a catheter inadvisable, and when the blood urea was not raised above 100 mg. per 100 ml. (iii) Suprapubic cystostomy and decompression of the bladder was performed under local analgesia on those patients unsuited for catheterization, who were in poor general condition, or who were gravely uraemic, and any further operative treatment was delayed.

The Non-Emergency Case

Symptoms and Physical Signs

When prostatic obstruction causes retention of urine the diagnosis is easy. When it causes sufficient trouble with micturition to bring the patient to the doctor the diagnosis is generally easy. There are some cases, however, in which urinary phenomena are so slight and their onset so gradual that the patients are unaware of anything wrong with the working of the bladder. These patients seek advice because of general symptoms, such as dyspepsia or loss of appetite, lack of power of concentration, lassitude, cardiovascular disease, abdominal discomfort, backache, haematuria, etc., and the condition of the bladder-neck obstruction is discovered on routine examination. Comparatively young patients with prostatic bars of fibrous or congenital origin come into this class.

These cases of silent obstruction can very easily be missed. On abdominal examination palpation or percussion may reveal a distended bladder, but on the other hand the bladder dome may be intraperitoneal and intestine may lie in front of it. The diagnosis in several such cases has been suspected by their medical attendants only by observing displacement upwards of the pelvic colon in the radiographs taken for suspected gastric disorders. These cases will not be missed if the physician or surgeon will examine the bladder bimanually by ballottement when making a routine rectal examination.

The ordinary symptoms of prostatic obstruction are well known, and I shall not enlarge upon them. It is important, however, that the doctor should be able to tell whether the condition is a straightforward one of prostatic obstruction or is complicated by other urological lesions. Suspicion should be aroused if terminal dysuria is a symptom. Some coexisting condition, such as infection, new growth, or stones, should then be expected. Again, haematuria is not, in my experience, a common symptom of prostatic enlargement, and when occurring in a case of obstructing prostate should not be assumed to be of prostatic origin. These cases require full investigation.

The presence of pus in the urine, whether sterile or not, should always arouse suspicion. Sterile pus may be present

in the urine in a case of uncomplicated prostatic obstruction. This may be due to trauma of the mucosa from overstretching or to compression of the mucous membrane as the result of gross hypertrophy of the bladder musculature. It may, however, indicate, and often does, associated lesions such as a stone, growths, tuberculosis, etc. An infected urine in a patient who has never been catheterized should also arouse suspicion.

Examination of the Prostate

The patient should be asked to pass urine before the examination.

Left Lateral Position.—The rectum is examined. The enlargement of the prostate into the rectum is recorded (0 to 4+) and its consistence noted. Any irregularities on its surface are discovered by light palpation or, if in the substance of the gland, by deep palpation. Any adhesions to or tethering of the rectal mucous membrane are observed. The presence or absence of the median groove and lateral fornices is noted. Can the upper notch be palpated? If so, is there any perivesicular infiltration? If the finger in the rectum is now rotated so that the pulp of the finger faces upwards it is often possible to examine the base of the bladder with the side of the finger. The middle finger of the hand lies in the fold between the buttocks, and as a result the finger can be introduced a greater distance. An infiltrating carcinoma of the bladder base may be recognized in this way.

Knee-chest Position.—The lumbar curve is exaggerated. The deep palpation of the prostate is repeated, and any crepitation noted which may indicate the presence of prostatic calculi. The seminal vesicles are examined and any perivesicular infiltration, whether neo-plastic or inflammatory, observed.

Supine Position.—The legs are flexed and abducted slightly, and a bimanual examination is then made as described below.

Clinical Determination of the Amount of Residual Urine and the Size of the Prostate Gland without Cysto-urethroscopy

The dangers of catheterization and cysto-urethroscopic examinations in cases of prostatic obstruction are at last being recognized. The passage of a catheter in order to discover the amount of residual urine should be unnecessary except in very stout patients or in one who refuses to co-operate, and even then the desired information will be given by the post-evacuation cystograms. If a coexisting stricture is suspected, then diagnostic catheterization is permissible.

There is a clinical method of determining the amount of residual urine which I have found of extreme value, as it enables a decision to be made in cases of doubt, without the passage of a catheter, whether operation is advisable or not. The ability to use it requires practice and experience. The method is as follows:

The patient lies supine, with the legs flexed and slightly abducted. He should then be told that a delicate examination is to be made, which necessitates relaxation of the abdominal wall, and that he must not resist when the surgeon's fingers dip into the abdomen. The right index finger in the rectum is put as high up as possible and the tip of the finger placed in contact with the prostate or bladder base, if this can be reached. The fingers of the left hand palpate the abdomen. The upper limit of the bladder can now be determined by ballottement, the impulse being transmitted to the finger in the rectum (Fig. 4). The amount of residual urine (if present) can be assessed with a high degree of accuracy.

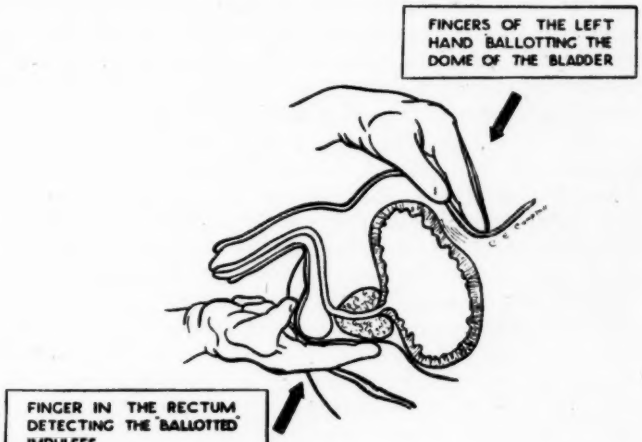

FIG. 4

The fingers of the left hand now sink into the pelvis and the prostate gland is examined bimanually. The degree of intravesical enlargement of the prostate can be fairly accurately determined in the majority of cases if the patient is not too stout or the residual urine or hypertrophy of the bladder musculature is not too excessive. The size of the gland is recorded—intravesical 0 to 4+, rectal 0 to 4+.

The information on the size of the prostate is of extreme value when deciding whether a perurethral prostatectomy should be performed.

The Role of Radiography

This subject is too extensive to be covered in a short paper such as this, but I should like to emphasize that the last radiographs of the series should be taken after micturition and the amount of residual urine can then be assessed.

Indications for Operation

I believe that prostatectomy should be performed as soon as the diagnosis of prostatic obstruction is established, unless coexisting diseases make the expectation of life short. To delay operation until renal damage has occurred or secondary cardiovascular disease has developed is not in harmony with modern views on preventive medicine. The beneficial effect of prostatectomy upon the cardiovascular system is often most striking. Angina of effort often becomes less troublesome. In cases of hyperpiesia the blood pressure often falls, adding considerably to the patient's comfort. I wonder how many patients would have been spared a cardiovascular catastrophe, such as a coronary thrombosis, if the prostate had been removed when it first gave obstructive symptoms.

In cases of slight obstruction without marked frequency or residual urine the patient may be kept under observation. It may be argued, however, that many of these cases will require operation in the end, and thus why not operate upon them early and avoid the risk of secondary changes in the kidneys and cardiovascular system? There is no doubt that many patients suffering from prostatic obstruction still come for treatment too late in the progress of the disease.

Surgical Treatment of Prostatic Obstruction: General Considerations

Care of the Indwelling Foley Catheter

The glands in the urethral mucous membrane secrete mucus, and adequate provision must be made for this to escape externally. A severe urethritis, with its serious sequelae, will follow within 48 hours of the introduction of the catheter if the meatus fits too tightly round the

catheter or if the catheter is too large and prevents free escape of this mucous discharge. I feel that failure to observe this principle is one of the reasons for pre- and post-operative sepsis and the development of urethral strictures, whatever type of operation is used.

After the catheter has been introduced a light dressing soaked in a water-soluble lubricant containing sulphacetamide is applied around the end of the penis and catheter and lightly bandaged or strapped in position. This lubricant prevents the mucus from drying and forming a crust which will impede further drainage of the mucus. Each day and sometimes twice a day the dressing is changed. The penis is retracted along the catheter and any dried mucus removed with "cetavlon" or weak "dettol" solution. The penis is then allowed to return to its original position and the dressing is reapplied. The patient in the pre-operative period should have daily baths.

Urethral Stricture and Congenitally Narrow Urethra

A strictured or congenitally narrow meatus can be enlarged successfully by a meatotomy. It is therefore important that the surgeon should know the calibre of the urethra behind a narrow meatus. In my clinics the urethra in the perineal and peno-scrotal regions and at the meatus is calibrated as a routine procedure. The present small Thompson punch has a size of 27 Ch., and if the measurement of the urethra is not satisfactory an open operation is preferred. If an open operation is definitely contra-indicated the instrument is inserted through an opening made in the bulb of the urethra and a perineal perurethral operation performed.

Knowledge of the size of the urethra is also of value in open operations, because the catheters are passed retrograde as recommended by Wilson Hey. The maximum size of catheter which can be comfortably taken by the urethra is known and the risk of trauma with possible stricture formation diminished.

It is often wise in these cases of a narrow urethra, after a transvesical prostatectomy has been performed, to insert a suprapubic catheter at the end of the operation as an additional safeguard instead of closing the bladder.

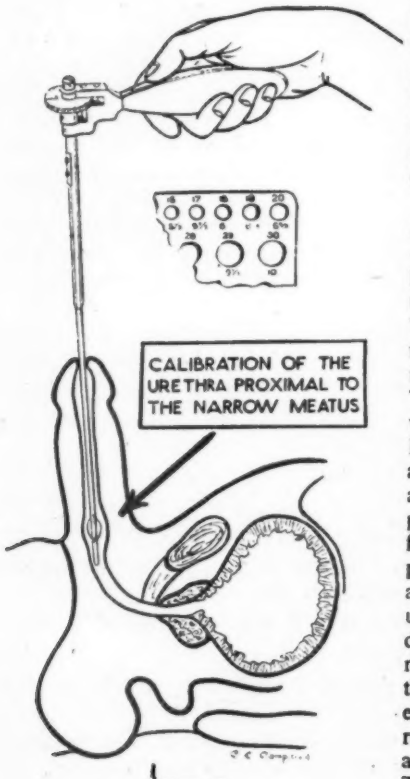

FIG. 5

Calibration of the Anterior Urethra (Fig. 5).—Sterile water-soluble lubricant is injected into the anterior urethra. The penis is held so that the penile and perineal urethrae are in line. The calibrator is passed with the blades closed. By means of the graduated wheel the blades are opened until the patient experiences a faint discomfort in the perineum. The blades are then slightly closed until all discomfort has disappeared and then reopened slowly until the patient again experiences discomfort. The reading on the graduated wheel is now noted. The instrument is then withdrawn slowly, and if the passage of the blades is impeded they are closed slightly until they can be withdrawn with ease. Absolute gentleness is necessary and the procedure must be atraumatic. In order to obtain the calibration of the various parts of the urethra in Charrière gauge the blades of the instrument are passed, after the examination, through the appropriate foramina in the metal gauge, starting with the smallest number noted on the graduated wheel. It is advisable to know roughly before the examination the number on the graduated wheel which corresponds to 27 Ch. The instrument is made for me by Messrs. Chas. Thackray, of Leeds.

The avoidance of pre-operative catheterization *of the bladder* has the disadvantage that a coexisting stricture in the bulb of the urethra may not be recognized until the time of operation.

If a surgeon over-dilates a stricture or stretches a congenitally narrow urethra in order to introduce a large-bore catheter or punch he will most certainly find that the stricture will become more troublesome in the future, and he will have transformed a congenitally narrow urethra into a strictured one.

History of a Gonorrhoeal Infection

Filmy strictures may be present, and, although an instrument or catheter may be passed without encountering any definite obstruction, blood may be noticed on the instrument. Relatively innocuous strictures may be changed into strictures that require treatment. It is advisable to perform an open operation in these cases, and a narrow urethral catheter should be used.

Prostatic Obstruction Complicated by Lesions of the Upper Urinary Tract

Severe sepsis or other urgent conditions in the upper urinary tract complicating a case of prostatic obstruction may necessitate a preliminary suprapubic drainage, followed by treatment of the renal or ureteric lesion. The prostate is removed later.

Cardiovascular Disease

Cases with cardiac decompensation usually improve rapidly once the chronic uraemia has been relieved by urethral drainage. Many cases which would appear hopeless at first become quite good operative risks after a few weeks. If fibrillation is present they are given digitalis. The use of mersalyl or "neptal" has proved a life-saving measure in some of these cases.

The cases which cause anxiety are those with gross hyperpiesia and those with a history of coronary thrombosis. These are preferably operated upon by the perurethral route. It is essential than no shock be permitted to occur during the operation and that the loss of blood be minimal. Once the blood pressure has been allowed to fall it may be difficult to get it back to normal limits, and, although the renal function may be excellent, secondary renal failure develops as a result of failure of the circulation. Intravenous saline is given by drip and also pressor substances are used irrespective of hyperpiesia.

Senility

In patients who are suffering from cerebral softening, even in an early stage, a prostatectomy, however successful as regards the urinary condition, is apt to cause further mental deterioration. They may become more confused and incontinent of urine and often also of faeces. Of all cases these have the worst prognosis, and if a patient shows signs of cerebral softening, even though these be only early, I now refuse to operate unless an acute retention is imminent. In some patients who are uraemic it may be difficult to decide how much of the mental change is due to renal failure and how much to cerebral degeneration. When

any real doubt exists it may be permissible to try the effect of urethral drainage, and if the mental condition clears up completely then a prostatectomy is justifiable.

Prostatectomy

It is in my opinion a mistake to use one method to the exclusion of others. Each individual case should be judged on its own merits. Surgeons will vary in their views on choice of operation, depending to a great extent on their relative skill and experience of results with each, and also on whether they have the time, patience, inclination, and nursing staff to persevere with the difficult technique necessary for the perurethral method. Since the advent of the modern open one-stage operations, with their good results, the incentive for the younger surgeon to learn the difficult technique is not so great as it was ten years ago.

Perurethral Prostatectomy

This operation was performed in 1,347 of this series of non-malignant cases, with a mortality of 3.04%. In the nursing-home 74.3% of prostatectomies were performed by this method, with a mortality of 2.1%. The Thompson punch was used in all cases. The great majority of the really bad-risk cases, including the derelicts admitted to the municipal hospital, were operated upon by this method. It also included the bad-risk cases referred from other centres.

It would appear to be not generally known among doctors that if this operation is properly performed the obstructing gland is removed as thoroughly as by enucleation and the risk of recurrence is no greater. "Resection" of prostatic tissue with the purpose of leaving a channel through which urine can pass should be the aim only in malignant cases.

The advantages of this method are immense. The patient has no wound and he is able, if he suffers from a bad chest, to cough without pain. Adiposity does not make the operation more difficult. Patients with poor cardiovascular systems, especially those with low blood pressure in association with hardened arteries, and those with a history of thrombosis, are more safely operated upon by this method. Urinary obstructions due to fibrous and malignant prostates are also indications for its use. The patient is allowed up twenty-four hours after the operation, and the catheter is removed on the first to the third post-operative day, and in the ordinary run of cases he is discharged home eight to ten days after the operation. The operative risk is less than by open operation, and many cases considered unsuited for the latter procedure can be operated upon by this method without undue risk.

The disadvantages are equally clear. The method is difficult to learn, as the surgeon alone has the operative field in view. At least 300 operations must be performed before the surgeon can really consider himself proficient, and he must have a sound urological background and an extensive experience of cystoscopic work before attempting this method of operating. Such surgeons are not created overnight, but once the skill has been acquired great satisfaction is given to patients and surgeon alike.

A nursing team trained in this type of surgery is essential, and operations performed under adverse conditions can only bring the method into disrepute. Further, an attempt to remove a very large prostate at one sitting by this method may result in severe shock or an incomplete operation. It is thus necessary for the surgeon to determine beforehand the size of the prostate by such a method as has been described, and he is then able from experience to decide whether the gland can be removed with a Thompson punch in one sitting with ease or with difficulty, or whether it would be better removed by open operation.

The amount of tissue individual surgeons can remove at one sitting with safety varies very much with experience. The maximum amount which I have removed successfully with the punch instrument at one sitting is 116 g. I feel, however, that multiple sittings are to be avoided if possible, and I prefer to remove large glands of 70 g. or more by open operation. The average prostate weighs about 30 g., and thus the majority of cases from this point of view are suitable for perurethral removal. I usually judge that a 3+ gland (e.g., intrarectal + +, intravesical +) can be completely and easily removed down to the true capsule and will weigh between 40 and 50 g.

The case of the indwelling Foley catheter is of paramount importance, and the value of frequent baths in this respect cannot be overstressed.

Open Prostatectomy

Transvesical procedures of various types in one or two stages and also retropubic operations were performed in 613 cases of this series (27.9%), with a mortality from all causes of 2.93%. The majority of the really bad-risk cases, however, were operated upon by the perurethral method.

It is of interest to note that in the early period, 1941–4 inclusive, one-stage operations were performed in 16% only of the suprapubic prostatectomies, whereas in the later period, 1945–8 inclusive, the percentage had risen to 70.9%.* The mortality did not alter to any extent—2.29% compared with 3% in the later period. Thus the more modern suprapubic methods have enabled a one-stage operation to be performed without increased risk in a greater number of cases. The reduction in the number of two-stage operations has resulted in a great saving in human discomfort and enabled many more cases to be treated in the available number of beds.

The main indications for an open operation are, in my opinion: (1) Prostatic obstruction complicated by the presence of a carcinoma of the bladder, large vesical diverticula, large vesical calculi, urethral stricture, or congenitally narrow urethra; (2) the large prostate of 70 g. or more; (3) large prostatic calculi—small prostatic calculi are no bar to the performance of a perurethral prostatectomy.

In the great majority of open operations the transvesical route was adopted. In the later years the bladder was closed in 90.5% of cases following the prostatectomy, whether it was a one-stage or a two-stage operation. In those cases in which the bladder was not closed a fine suprapubic catheter was retained until bleeding had ceased, and was then removed. The urethral catheter was retained for not longer than seven days. Suprapubic leakage did not occur in 75% of cases. In those cases in which leakage did occur the suprapubic sinus closed within 48 hours in 16%, and in the remainder within seven days from the removal of the urethral catheter.

Treatment of Carcinoma of the Prostate

Cases of carcinoma of the prostate without marked residual urine and with normal renal function were treated by the administration of synthetic oestrogens†—dienoestrol 20 mg. or ethinyl oestradiol 1–3 mg. daily—and their progress observed. Radiographs of the bones of the pelvis and blood-acid-phosphatase examinations were carried out

*A number of two-stage cases in the later series were referred for prostatectomy from other centres. A suprapubic cystostomy had already been carried out.

†When oestrogen therapy proved inadequate the testicles were removed in a few cases with temporarily beneficial results.

at two-monthly intervals. If residual urine was considerable or renal impairment evident the cases were observed weekly, and if rapid improvement did not occur a perurethral resection was carried out. Cases suffering from acute retention were as a rule submitted to perurethral resection after preliminary catheter drainage if necessary, and oestrogen given by the mouth subsequently. If microscopical examination revealed an undifferentiated carcinoma, deep *x*-ray therapy was often given in addition to synthetic oestrogen by the mouth, as my experience had suggested that this form of cancer was less likely to be kept in check by oestrogen therapy alone.

Results in a Series of 176 Malignant Cases Admitted to Hospital

145 (82%) submitted to operation:		
101 (70%) ..	Perurethral resection	Deaths 3 (2·8%)
30 (20%) ..	Suprapubic prostatectomy ..	Deaths 2 (6·6%)
14 (10%) ..	Suprapubic cystostomy	
31 (18%) not submitted to operation:		
25 (14% of total)	.. .. ..	Dienoestrol alone
7	.. .. ..	Died in hospital

Summary

A clinical method of diagnosis to prevent cases of prostatic obstruction being missed is described. The treatment of the acute cases and the indications for the various types of operations are discussed.

The paper is based upon a series of 2,192 consecutive cases of bladder-neck obstruction due to non-malignant disease of the prostate, of which 1,960 cases were submitted to prostatectomy, with a mortality from all causes of 3.01%. The perurethral method was used in 68.73% of cases (74.3% in private cases).

The perurethral method is considered the method of choice in the majority of cases.

The treatment of cancer of the prostate is discussed.

Prostatic obstruction should be relieved as early as possible before secondary changes occur in the renal and cardiovascular systems: too many cases still come for treatment late in the progress of the disease.

I wish to thank Sisters Deacon, Meek, and Walker, without whose care, organization, and enthusiasm these results could not have been obtained. My grateful thanks are also due to Mr. Hadda, past registrar, and to Messrs. Breckenridge and Harrison, present registrars, for operating upon many of the cases, and also to Mr. Harrison for compiling the results. Last, but not least, I thank the many house-surgeons who have helped me.

When Sir William Marshall delivered his presidential address at the annual conference of the Scottish Association of Executive Councils on September 30 he said that they heard from all sides about the heavy demands on the services of the doctors, and it was clear that these demands were excessive and sometimes even unreasonable (*Scotsman*, October 1). Doubtless when the novelty of the scheme had worn off the rush to the doctor's surgery might lessen, but every consideration should be given to methods of reducing claims on the doctor's time for non-medical purposes. The call for certificates was using up much time which should properly be devoted to clinical work. Waste and extravagance must be checked. Some rearrangements might be necessary to bring home to the people the need for limiting their demands to what was in actual fact necessary. Claims for repairs, both to dentures and spectacles, were increasing month by month. Executive councils had a right in cases of negligence to refuse replacements or to make the applicant pay part of the cost, but this implied inquiry, which was both difficult and distasteful. As the State had already met the primary cost, it might well be left to the individual to meet the charge for repairs, with perhaps some power of the executive council to waive this in cases of real need. Whether it would be possible to make any charge in the case of drugs was more doubtful, but with regard to appliances there might be some provision to entitle the executive council to insist on payment of at least part of the cost.

MULTIPLE MYELOMA

A NOTE ON EIGHT CASES

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[WITH PHOTOGRAVURE PLATE]

Until recently multiple myeloma was considered a comparatively rare disease. Its incidence was given as 0.03% of all malignant growths (Brewer, 1948), and the post-mortem incidence of three large hospitals was 16 in 19,000 (0.084%). Since the introduction of marrow biopsy as a means of diagnosis more cases have been recognized, and in the last few years larger series have been published.

We were struck by the frequency of the disease at this hospital. Eight cases were diagnosed during 1948, five of them coming to necropsy during that year and two since then. This gives a post-mortem incidence for 1948 of 5 in 442 (1.13%). This high figure may, however, be to a certain extent due to selection. It represents 2% of all deaths from malignant disease occurring in the hospital—a substantially higher proportion than previous figures would suggest.

There have been very full reports in the recent literature by Atkinson (1937), Snapper (1943), Harwood Stevenson (1948), and others. We are therefore confining our remarks to some points in these eight cases which appear to be of special interest.

Symptoms and Signs

First, the way in which these patients presented. Most of them complained of pain in the lower part of the back, general weakness, and vomiting. The last-named symptom has not been mentioned much by other writers. It occurred with normal blood-urea levels and was not caused by treatment. Anaemia was also prominent, and was normocytic or microcytic. Collapsed vertebra was one of the presenting signs in two patients, but the incidence and distribution of backache had no relation to the location of this lesion.

We confirm the well-recognized fact that the E.S.R. is very rapid, reaching 80–120 (Westergren) in the first hour. One of our patients, however, had an E.S.R. of only 15 and 25 in the first and second hours respectively. She was one of the most rapidly progressive diffuse cases, but her plasma proteins were normal. In another case extremely rapid agglutination prevented readings.

Albuminuria was present in every case, and Bence-Jones proteins were found in seven patients, though their presence varied from week to week. Most writers give figures of from 50 to 75% for the occurrence of Bence-Jones proteins, but Magnus-Levy (1932), giving a figure of 80%, points out the difficulty of their demonstration at times, especially in the presence of albumin.

A finding that has not often been reported is the presence of a raised C.S.F. protein, which was seen in the three cases which had lumbar punctures. Cabot (1934) found a raised C.S.F. protein in one patient, who, however, had tumours growing into the subarachnoid space. Only one writer—Magnus-Levy (1933)—reports the undoubted presence of Bence-Jones proteins in the C.S.F. We tried to demonstrate this, but were unable to do so in any of the three cases examined.

Blood Chemistry and Cytology

The blood chemistry may be of help in the diagnosis, although the findings are not always characteristic. According to Magnus-Levy (1933), 50 to 60% have raised plasma proteins, due to a raised globulin and sometimes to increased fibrinogen (Reimann, 1932). About the same number have a raised serum calcium with a normal or even increased phosphorus. This helps to distinguish them from cases of osteitis fibrosa cystica, in which the phosphorus is usually lowered. The increased calcium is probably due not only to the mere increase of calcium bound to globulin but also to the destruction of bone by neoplasm (Gutman and Gutman, 1936). This is borne out in one of our patients, who had a raised calcium with normal plasma proteins (Case 8).

In this series also there was a great variation in the appearance of the cells, but in all cases the cells were easily recognized as myeloma-plasma cells (Plate, Figs. 1 and 2). While in a normal marrow there may be 1 to 2% of plasma cells, the percentage of these cells varies from 20 to 90% of the cells in the marrow of these patients. It is interesting to note that in one of the patients the diagnosis was made only after the second marrow biopsy, the first one containing only 3% of plasma cells. The cells varied from typical plasma cells to much larger cells with less densely staining nuclei, not always eccentric and showing nucleoli (Fig. 1). The general features of the cells were, however, the abundant basophilic cytoplasm with frequent degenerative changes such as vacuolization. Sometimes a perinuclear clear area, or "Hof," was seen, and usually the nucleus was eccentrically placed. Multinucleated cells were frequent.

Table giving Details of Cases. (W.R. and Kahn negative in all cases. Alkaline phosphatase expressed as King–Armstrong units. Serum phosphorus expressed as inorganic PO_4.) Albumin was present in urine in every case

No.	Sex and Age	Presenting Symptoms	Urine (Bence-Jones Protein)	Blood	Marrow % of Plasma Cells	Blood Chemistry	E.S.R.	C.S.F.	X-ray Findings	Course	Post-mortem Findings
1	F 54	Abdominal pains; vomiting; low backache; swellings skull and ribs	+	Hb 52% R.B.C., 2·58 m. W.B.C., 4,300 No plasma cells	Biopsy of rib +	Total proteins 9 g.% (alb. 6·4 g.%, glob. 2·6 g.%) Cal. 12·9 mg./100 ml. Alk. phos. 8·5 u. Urea 206 mg./100 ml.	—	—	Lesions in skull and ribs	Died within 5 months of onset of symptoms	Tumours of skull, ribs, and lumbar vertebrae
2	F 65	Low backache and weakness	+ intermittently	Hb 44% R.B.C., 2·5 m. W.B.C., 4,000 No plasma cells	27%	Total proteins 13·5 g.% (alb. 2·6 g.%, glob. 10·9 g.%) Cal. 10·8 mg./100 ml. Alk. phos. 8 u. Urea 41 mg./100 ml.	Very high	Prot. 125 Glob. + Cells 1	Generalized decalcification pelvis and femora	Relief from stilbamidine. Still alive	
3	F 74	Nausea and vomiting; swelling of sternum	+	Hb 98% R.B.C., 4·68 m. W.B.C., 7,400 No plasma cells	Not examined	—	—	—	Lesions skull, ribs, and sternum	Died within 5 months of onset of symptoms	Tumours of skull, ribs, sternum, and femur
4	F 65	Low backache radiating down right leg; pelvic mass; vomiting	+	Hb 50% R.B.C., 2·62 m. W.B.C., 5,200 No plasma cells	25%	Total proteins 7·5 g.% (alb. 1·8 g.%, glob. 5·7 g.%) Cal. 12·8 mg./100 ml. Alk. phos. 4 u. Urea 55 mg./100 ml.	135	Prot. 160 Glob. + Cells 3	Lesions in skull	Died 10½ months after onset of symptoms. No response to stilbamidine	Tumours of spine, skull, and pelvis
5	M 66	Heart failure; anaemia	−	Hb 53% R.B.C., 1·4 m. W.B.C., 1,150 No plasma cells	55%	—	−	−	−	Died very soon	No macroscopic tumours; diffuse infiltration
6	F 62	Nausea; vomiting; hoarseness; weakness	+	Hb 49% R.B.C., 1·35 m. W.B.C., 38,800 Plasma cells 16%	50%	Total proteins 10·5 g.% (alb. 3·6 g.%, glob. 6·9 g.%) Cal. 10·6 mg./100 ml.	160	−	Lesions in skull	Died within 5 months of onset of symptoms. No response to stilbamidine	Tumours of skull, ribs, and sternum
7	M 63	Backache	+ intermittently	Hb 71% R.B.C., 3·3 m. W.B.C., 17,300 Plasma cells 3%	22/10/48 3% 22/11/48 22%	Total proteins 10 g.% (alb. 2·6 g.%, glob. 7·4 g.%) Cal. 10·7 mg./100 ml. Alk. phos. 5·7 u. Urea 30 to 170 mg./100 ml.	70	Prot. 100 Glob. + Cells 3	Lesions in skull and cervical vertebrae	Died 6 months after onset of symptoms. Some relief of pain with stilbamidine	Tumours of skull, ribs, spine, and femur
8	F 66	Low backache; fracture of sternum; vomiting	+	Hb 72% R.B.C., 3·06 m. W.B.C., 7,000 No plasma cells	75%	Total proteins 6·5 g.% (alb. 4·8 g.%, glob. 1·7 g.%) Cal. 13·1 mg./100 ml.	15	−	Lesions in spine, ilium, and skull	Died 5 months after onset of symptoms. Some relief of pain with stilbamidine	No macroscopic tumours; diffuse infiltration

The diagnosis rests, of course, on the demonstration of myeloma cells in bone marrow, usually obtained by sternal puncture, but in one of our cases obtained by puncture of the iliac crest, as the sternum was too tender (Case 8). Since the introduction of marrow biopsy and the staining of smears by the Romanowsky method it seems to be fairly generally agreed that the myeloma cell is related to the plasma cell and probably derived from the reticulum cell (Boyd, 1944; Bayrd, 1948). The pleomorphism, not only from case to case but also in individual cases, probably accounts for the previous reports of such varieties as lymphoblastic and erythroblastic myeloma.

Two of the cases were of the diffuse type described by Ulrich (1939), Churg and Gordon (1942), and others, which even at necropsy may be difficult to recognize without marrow studies. In one of these, in spite of typical punched-out translucent areas in the radiographs, a fractured sternum, and two collapsed vertebrae, there was at necropsy no evidence of the usual whitish gelatinous tumours, but the whole marrow was dark red. Microscopically, it contained a very high percentage of plasma cells (Case 8). Case 5 had a macroscopically normal marrow. Some of these

cases may show little or no abnormality in the radiographs, except perhaps some general decalcification (Snapper, 1943).

The kidneys show typical changes, which are now thought to be primarily due to a blockage of the renal tubules with Bence-Jones proteins (Ehrich, 1932; Bell, 1933; Snapper, 1943). Other writers (Thannhauser and Krauss, 1920; Perla and Hunter, 1930) think the changes are due to a nephrosis akin to amyloid disease. These changes, consisting of an accumulation of eosinophil material in the collecting tubules, which are distended, and an increase in interstitial tissue, were well seen in four of these cases (see Fig. 3).

In seven cases the course of the illness was under 12 months, and treatment with stilbamidine or pentamidine had no effect, though relieving pain in three cases.

ADDENDUM

Since this paper was written three further cases have been studied. All had a raised C.S.F. protein. In one (Case 11) the C.S.F. protein was raised while the plasma proteins were still normal. In these cases the C.S.F. may be a more sensitive index of raised proteins than the plasma. In cases presenting with neurological signs the finding of a raised protein in the C.S.F. may be misinterpreted and the widespread nature of

Table giving Details of Three Further Cases

No.	Sex and Age	Presenting Symptoms	Urine (Bence-Jones Protein)	Blood	Marrow % of Plasma Cells	Blood Chemistry	E.S.R.	C.S.F.	*X*-ray Findings	Course	Post-mortem Findings
9	F 54	Backache; cough; weakness of legs	+	Hb 44% R.B.C., 2·2 m. W.B.C., 3,900 Plasma cells 1%	70%	Total proteins 12·6 g.% (alb. 1·88 g.%, glob. 10·72 g.%) Cal. 10·4 mg./100 ml.	163	Prot. 340 Lange 5555554310 W.R. negative Glob. + Cells 1	Lesions in skull, spine, and long bones; collapse L3	Died about 6 months from onset of symptoms	Tumours of skull, sternum, and spine
10	M 47	Backache radiating down right leg	+ intermittent	Hb 77% R.B.C., 3·5 m. W.B.C., 12,300 No plasma cells	6%	Total proteins 8·15 g.% (alb. 3 g.%, glob. 5·15 g.%) Cal. 16·8 mg./100 ml. Alk. phos. 36 u. Urea 96 mg./100 ml.	60	Prot. 93 Lange 3344300000 W.R. negative Glob. + Cells 1	Diffuse involvement of skull spine, and long bones	Relief of pain with stilbamidine	
11	F 68	Backache; epigastric pain; girdle pain progressing to compression; paraplegia	+	Hb 83% R.B.C., 3·9 m. W.B.C., 9,200 No plasma cells	27%	Total proteins 7·05 g.% (alb. 3·6 g.%, glob. 3·43 g.%) Later: total 7 g.% (alb. 2·52 g.%, glob. 4·48 g.%) Urea 17 mg./100 ml.	7 later 27	Prot. 390 W.R. negative Lange negative Glob. + Cells 2	Spine; N.A.D. skull: a single punched out myeloma	Complete compression; paraplegia D9-L1. ?Relief of girdle pain following pentamidine	

Treatment

Treatment is still very unsatisfactory. Geschickter and Copeland (1928) report the average duration of the disease as two years in 425 cases, the longest recorded being five and a half years. Remissions were sometimes seen. In this series the duration was much shorter, being five to twelve months in all except one patient, who has now lived for sixteen months since the onset of symptoms. Recently stilbamidine and pentamidine have been tried, and varying reports on their efficiency have been published. Snapper (1946) was responsible for introducing them. Recent reports by Brewer (1948) and Propp *et al.* (1949) of cases treated with stilbamidine were not very favourable, and certainly did not indicate remission or arrest of the disease, though pain was relieved in some cases. Some of the patients in our series were so treated, with indifferent results. Pain was relieved in three out of five cases, but the treatment did not appear to influence the course of the disease.

Summary

Eight cases of multiple myeloma were seen in the course of 12 months, five of them coming to necropsy, giving a post-mortem incidence of 1.13%.

The method of presentation was by backache, weakness, vomiting, collapsed vertebra, anaemia, and albuminuria.

Seven out of eight cases had Bence-Jones proteins, and all had albumin in the urine.

Three cases in which the C.S.F. was examined had a raised protein.

The cytology of the bone marrow is discussed, with special reference to two diffuse cases.

Four cases showed typical changes in the kidneys.

the lesion overlooked. Laminectomy proves technically difficult, and, we understand, such patients do badly. Laminectomy is probably contraindicated.

We wish to record our thanks to Dr. N. F. Coghill for help and encouragement in the preparation of this paper and for making Cases 2, 4, and 6 available to us. The other cases were made available through the kindness of Dr. Marjorie Warren (Cases 1 and 3), Dr. J. A. Torrens (Case 7), and Dr. M. M. Deane (Cases 5 and 8). We also wish to thank Dr. A. C. Spence for the marrow studies, Dr. A. C. Counsell for the pathological investigations, Dr. M. Lubran for the biochemical investigations, and Mr. D. A. Vinten for the photomicrographs.

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FATAL POISONING OF AN INFANT BY ANTI-ANAEMIC PILLS CONTAINING IRON, MANGANESE, AND COPPER

BY

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[WITH PHOTOGRAVURE PLATE]

The use of iron in therapy dates back to Celsus, who treated splenomegalic anaemia by the administration of the water in which smiths had drenched their red-hot irons. It was not until 1746, however, that Menghinis discovered the presence of iron in the blood and so gave a reason for a form of therapy which has come into active use only within the last two generations. The benefits of vigorous ferro-therapy in special instances are so striking that iron is now too often used as treatment for any anaemic condition. More recently it has been found that traces of copper and manganese are necessary adjuvants in iron therapy, and the three metals are now available in the form of pills which are stable, effective, and elegant. There is little doubt that these pills are prescribed very frequently, as is shown by the fact that in this region, with a population of approximately 400,000, the five main hospitals issued approximately 500,000 of these pills in a period of six months. Unfortunately, the figures of the quantity prescribed by the practitioners are not available.

That ingested iron is not without danger is seen in Kachin Beck disease (Hiyeda, 1939), a disease occurring among children in Manchukuo and North Korea, due to continuous chronic overdosage with iron in the drinking-water. Acute overdosage by ingestion of pills containing iron, manganese, and copper has been recorded as causing death in three infants (Forbes, 1947; Thomson, 1947). The present case is presented because it allowed the investigation of certain points not available for study in the earlier cases, and its occurrence emphasizes again the need for every doctor and pharmacist, when supplying such pills (e.g., fersolate), to warn the mother of the extreme danger to infants.

Case Report

At approximately 7.30 p.m. on February 8, 1948, a girl aged 11 months swallowed some pills with which she had been playing. Each of the pills contained ferrous sulph. exsic. 3 gr. (0.2 g.), copper sulphate 1/25 gr. (2.6 mg.), and manganese sulphate 1/25 gr. (2.6 mg.). The exact number swallowed is unfortunately not known, as the mother seized the remainder and threw them in the fire. The child became very drowsy and vomited. The vomit was at first green and later became brown. She was admitted to Dundee Royal Infirmary at 9.30 p.m.—i.e., two hours after ingestion of the pills.

On admission she was pale and drowsy, but not cyanosed; she made no resistance to examination. The pulse was rapid but regular, the respiratory system seemed normal, the abdomen was soft and nowhere tender, the pupils reacted normally, and there was no evidence of neck rigidity.

Shortly after admission she vomited, the vomitus being brown in colour and streaked with bright-red blood, but there was no further vomiting after 10 o'clock that evening. She was treated immediately on admission with chalk mixture and sodium bicarbonate.

The next day she seemed to be much better, sitting up in her cot, taking notice of her surroundings, and playing with her toys. Two dark tarry stools were passed during the day, but there was no diarrhoea. On the morning of the 10th she was found to be much worse, with cyanosis of the lips and moist accompaniments to the breath sounds at both bases. Sulphadimidine ("sulphamezathine") and penicillin were given, but her condition deteriorated rapidly and she died at 1.10 p.m., 39 hours after ingestion of the pills.

Post-mortem Examination Report (21 hours after death).—"The body is that of an adequately nourished infant with slight cyanosis of the lips but no jaundice in skin or conjunctivae. The *stomach* shows an area of extreme congestion, containing numerous small haemorrhagic points with some oedema, and closer study reveals that in this area mucosal damage of varied degree is present. This area is situated in the middle third of the stomach, nearer the greater curvature, and extending upwards on the anterior and posterior walls. From this central area of intense change a lessening degree of reaction spreads over the remainder of the stomach. The stomach contains approximately 15 ml. of dark-brown coffee-ground material. In the *small intestine* there are a few areas of congestion and swelling, but this is not so marked as in the stomach; the three main areas of reaction are situated on the anterior wall of the third part of the duodenum, in the proximal jejunum, and as a diffuse slightly affected area in the proximal ileum. It is noted that the Peyer's patches are not affected. The ileum contains dark tarry faecal material. The *liver* (2 lb., or 0.9 kg.) is pale, flabby, and greasy to touch. The *spleen*, which is normal in size, weight, and consistence, presents a mottled appearance, light spots flecking the cut surface.

"The *lungs* show a considerable degree of congestion, and in the right upper lobe a small area of haemorrhage is present on the anterior border. The *heart* shows dilatation of the right auricle and ventricle, and the myocardium is generally soft and flabby. The valves are competent. The *pericardium* and *thymus* seem normal, as do the *gall-bladder*, *pancreas*, and *suprarenals*. The *kidneys* are pale, but apart from this appear healthy, with normal ureters; the bladder, which is also normal, contains 18 ml. of clear urine. The *reproductive organs* are normal, as are the *brain* and *meninges*."

Special Examinations.—Analysis of the urine, gastric and caecal contents, and the bile for iron, copper, and manganese resulted as follows:

	Gastric Contents	Caecal Contents	Bile	Urine
Fe	0·455%	0·529%	0·0158%	0·0037%
Cu	0·0099%	0·00235%	0·00452%	0·000044%
Mn	Present	0·0024%	0·0057%	None

That the high gastric and caecal iron content is not entirely the result of the haemorrhage from the mucosal damage is shown by the presence of copper and manganese in the same samples. The "metabolic route" of the manganese is indicated by its obvious presence in the bile and its absence from the urine; the copper content of both bile and urine agrees with its recognized route of excretion. Since these estimations were made on isolated specimens obtained at necropsy it is unwise to compare them with normal excretion values, but they are much higher than those considered normal.

Histology.—The main lesions occur in the gastro-intestinal tract. In the stomach, the area of acute gastritis described above is seen to consist of localized areas of severe necrosis (Plate, Fig. 1) of the gastric mucosa with a striking impregnation of the adjacent reticulum by iron (Fig. 2), recalling the impregnation described in the pulmonary reticulum in haemosiderosis (Scott Park *et al.*, 1947). There is also oedema of the submucosa, and under the areas of necrosis the veins show thrombosis with iron impregnation of their walls (Fig. 3). Deeper still, the as yet not thrombosed vessels show thickened endothelium which contains masses of iron granules. The liver (Fig. 4) shows a widespread and surprisingly uniform fatty change and some iron is present, but in no great amount—much less than used to be seen in the typical case of pernicious anaemia. The presence of copper and manganese in the liver can perhaps be deduced from the fact that the reaction with sulphide shows more metal in the hepatic cells than is revealed

by Perls's reaction for iron. The tubules of the kidney show cloudy swelling but no other lesion, and iron could not be demonstrated. The only other significant finding in the viscera was necrosis of the Malpighian corpuscles of the spleen.

Discussion

Although previous reports have dealt with the toxicology of this condition, this new case raises some points in the clinico-pathological synthesis that are of interest.

It appears from the microscopical examination that once the gastric mucosa is damaged the iron escapes from the lumen into the tissues and leads to thrombosis of the submucosal veins; this thrombosis would seem to act as a block, in that comparatively little iron has been found in the liver. None the less, it is difficult to escape the conclusion that the gross fatty change in the liver is due to absorption of substances from the lumen through the areas denuded of mucosa, or possibly from the breakdown products of the mucosa itself. The extent and degree of the change in the liver seem scarcely sufficient to explain the fatal issue, but in view of the failure to find any other cause of death one might assume that the damaged liver, although capable of sustaining life for some time, was not capable of maintaining its detoxicating process in the continued presence of this absorption. The final collapse of the liver, by allowing access of the absorbed substances to the rest of the body, led to the sudden exitus. The necrosis of the Malpighian corpuscles is probably associated with that generalized toxaemia.

The present case emphasizes again two important clinical points. First, it is of the utmost importance to begin treatment urgently for the sake of the gastric mucosa, as it seems probable that the gastric mucosa is the first and main line of defence of the liver. In this respect it is of interest to note that a recent paper described a case of recovery after the ingestion of similar pills in which treatment was started at once by the patient himself, and little evidence of liver damage could be found (Roxburgh, 1949). The histological findings in the present case fail to provide any suggestions for specific therapy, and one can merely repeat the probable value of early administration of alkali to form insoluble hydroxides. It would seem that dimercaptopropanol (BAL) is unlikely to be of help (McCance and Widdowson, 1946) in such cases; it was used by Roxburgh, who makes no claim, however, for its value.

The second point of clinical importance is the occurrence of a misleading period of improvement and apparent well-being before a rapidly fatal termination. A similar false recovery occurred in one of Forbes's cases, and the fact should perhaps be stressed that in treatment of such cases this period of betterment neither lessens the gravity of the prognosis nor permits any relaxation of therapeutic activity.

Summary

A case is described of fatal poisoning of an infant by pills containing iron, copper, and manganese.

The clinical course showed a period of apparent recovery followed by sudden death: this misleading sequence occurred also in one of the previously reported cases.

The histological findings suggest that the destruction of the gastric mucosa leads to lethal hepatic damage.

It is the duty of doctors and pharmacists to warn parents of the grave risk to infants presented by these visually attractive pills.

I wish to thank Professor A. C. Lendrum for his help and advice in the preparation of this paper and Mr. A. Dargie, Dundee City Analyst, for the analysis of the specimens of gastric and caecal content, bile, and urine. I am also grateful to Dr. J. Thomson, Royal Infirmary, Dundee, for the clinical details, and to Mr. J. W. Corkhill for the photomicrography.

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SYNOVIAL OSTEOCHONDROMATOSIS

TWO UNCOMMON EXAMPLES

BY

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[WITH PHOTOGRAVURE PLATE]

Synovial osteochondromatosis is a well-recognized condition, but the two cases reported here presented some unusual features.

Case 1

The patient, a man aged 23, had a history of stiffness of the right shoulder for about six months, associated with occasional slight pain, but with no obvious cause beyond some trivial injuries in the past. On examination there was a complete absence of any movement in the right shoulder-joint.

Radiological examination disclosed enormous numbers of opaque loose bodies, of varying size and density, occupying the entire shoulder-joint and extending into the subscapular bursa and the synovial sheath of the long head of the biceps. Synovial osteochondromatosis was diagnosed (Plate, Fig. 1). There was no abnormality elsewhere.

At operation the right shoulder-joint was exposed through a long anterior incision. On opening the bulging synovial membrane loose bodies were scooped out by the dozen, but many still attached to it had to be avulsed or dissected out. An attempt at synovectomy was abandoned owing to tough adhesions and haemorrhage, but the whole of the synovial sheath of the long head of the biceps was excised and also as much as possible at the site of the reflection of the synovial membrane on the humerus. All loose bodies were removed after a complete exploration.

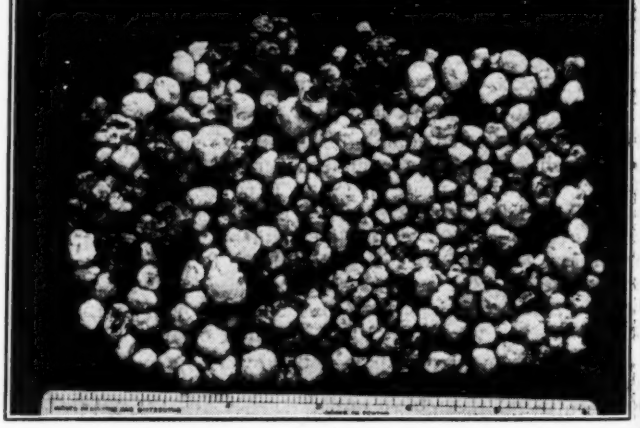

FIG. A.—Case 1. Photograph of loose bodies after removal.

Pathological Condition.—The entire synovial membrane was red, rough, and oedematous. The earliest lesions were tiny nodules and small sessile excrescences, and were most pronounced at the reflection of the synovial membrane and in the bicipital groove. Larger bodies were hanging in clusters, and other solitary bodies possessed a mere hairlike pedicle. The largest bodies, up to 2 cm. in diameter, were lying completely detached and mobile within the joint. Those with any degree of pedicle were red and still retained a blood supply, but the actual loose bodies were yellow and more polished; all were somewhat rounded, with a pitted irregular surface. There were more than 350 osteochondromata, including several clusters not yet independent (Fig. A); very tiny ones still embedded in the synovial membrane were difficult to count accurately. Their total weight was 67.5 g. There was marked osteoarthritic lipping at the edge of the articular cartilage of the humerus, together with an erosion of the cartilage in the centre of the head where a loose body had been impacted.

Histological examination of a portion of the synovial membrane with the earliest changes demonstrated well-marked cancellous bone formation, as well as fibrous tissue and cartilage; there was extensive proliferation of the synovial tissue (Fig. 2).

Several of the loose bodies were examined radiologically after removal and showed a central opaque nucleus, surrounded by more dense peripheral laminae of calcification.

Progress.—Healing was uninterrupted, and no remaining loose bodies were found on subsequent radiological examination. Two months after operation a moderate degree of all movements had been restored, but further follow-up proved impossible. The formation of the osteochondromata appeared so active that it is almost certain that they will develop again, necessitating a second operation. A stiff shoulder is the probable final result, especially as osteoarthritis is already established.

Case 2

This patient, a man aged 55, sustained a trivial injury to the left ankle, and two weeks later was seen on account of swelling and moderate disability. Radiological examination revealed several opaque loose bodies, posterior to the ankle-joint, which were typical of synovial osteochondromata (Fig. 3). There were also early changes of osteoarthritis in the ankle-joint.

At operation a postero-medial incision was made and the loose bodies were found lying in a large bursa communicating with the synovial tendon sheath of flexor hallucis longus. Some were quite loose and others were attached in clusters to the synovial lining, which was otherwise healthy. All the osteochondromata were removed and the entire bursa was excised. A good recovery followed.

Comments on the Condition

Site of Origin.—Henderson and Jones (1923) observed that the site of reflection of the synovial membrane is the common site of origin of osteochondromata within a joint; this is the region of differentiation in the foetus, and is the most favourable situation for disarrangement of cells which in later life may take on properties not normally possessed. The findings in Case 1 are thus clearly in confirmation.

Nature of the Condition.—Osteochondromatosis is now generally accepted as being a benign neoplasm, developing from embryonic rests or from a metaplasia of connective-tissue cells. Although malignant synovial tumours are well known, it is seldom appreciated that malignant change may supervene on osteochondromatosis on very rare occasions; Geschickter and Copeland (1936) and Brailsford (1948) refer to cases in which a sarcoma developed. Bennett (1947) showed the necessity for following up all benign neoplasms or other tumour-like lesions of synovial tissue because of the risk of subsequent malignancy and also because there may be difficulty at first in distinguishing histologically between benign and malignant conditions. In Case 1 recurrence seems almost certain owing to the activity of the growth of osteochondromata, and it is interesting to speculate on the possibility of ultimate malignant change.

Growth of Bone.—The growth of bone and the increase in size of the osteochondromata are in keeping with the opinions of Greig (1931). He maintained that bone forms before a loose body becomes detached, for the reason that bone formation requires an adequate blood supply, not available after the loose body is once free. Any increase in size after detachment is then due to increase in the amount of cartilage, which can derive nutrition from synovial fluid. Calcification, as distinct from ossification, may occur thereafter in the periphery of the loose body.

Involvement of Shoulder-joint.—This is a very rare site, coming in order of frequency after knee, elbow, ankle, and hip joints. Albee (1927) removed 64 loose bodies, and Henderson and Jones reported another case, both being followed by recurrence. The condition was also demonstrated by de Lorimier (1943), Behrens (1947), and Brailsford.

Involvement of Bursae and Tendon Sheaths.—Being closely related to joints embryologically, these are subject to the same pathological conditions and may become the site of loose bodies. Osteochondromatosis is not common in them and may occur independently or in association with a similar joint lesion. References have been made, amongst others, by Henderson and Jones, Geschickter and Copeland, Buxton (1923), Janik (1927), and Shepherd (1943).

Numbers of Loose Bodies.—A solitary osteochondroma may occur. Very large numbers, however, have been recorded, such as 700 by Timbrell-Fisher (1921), 1,047 by Berry (quoted by Timbrell-Fisher), and 415 by Boyd (1947), all in the knee, and 1,000 by Brailsford in the hip. As a rule the number is much smaller, and the figure of at least 350 in Case 1 is well above the average.

Treatment

Operation is required if there is to be any hope of recovery of function of the joint or prevention of osteoarthritis. According to Timbrell-Fisher, the process of loose-body formation may end as suddenly and mysteriously as it began, and the results of operation are good provided the condition is not then progressive; otherwise there is recurrence and a second operation becomes necessary. Henderson and Jones extracted ten loose bodies from a shoulder-joint through a very small posterior incision, but, though possibly effective in certain instances, this limited type of exposure does not seem applicable in the presence of large numbers, especially if still attached to or involving synovial extensions of a joint. Wilmoth (1941) performed a partial synovectomy, with removal of loose bodies, in most of his cases, but was uncertain regarding the prevention of recurrence. A total synovectomy is the best method of ensuring against recurrence in a case with extensive involvement, but it is not attainable in all joints nor under such conditions as in Case 1.

Involvement of a bursa is easily treated by its complete excision. In a tendon sheath, simple removal of loose bodies is the usual treatment, but occasionally total excision of the synovial lining is possible.

Summary

Two uncommon examples of synovial osteochondromatosis are reported. In one case the shoulder-joint was involved most extensively, over 350 loose bodies being removed. In the other the loose bodies were in a bursa in direct communication with

a tendon sheath at the ankle: recovery followed removal of the osteochondromata and excision of the bursa.

I wish to acknowledge my indebtedness to Messrs. A. H. Baird, who carried out the photography.

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A STUDY IN VISUAL DEFECTS IN YOUNG CHILDREN

BY

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It is evident from the annual returns of the school health service that amblyopia and strabismus form a large proportion of cases of defective vision. It is the purpose of this paper to describe a simple method whereby gross errors of refraction in children under the age of 5 can be ascertained. We demonstrate that this method is accurate enough to be used on a wide scale, that a large number of children in the age group discussed suffer from gross errors of refraction, and that it is important from a preventive aspect that they should be detected and treated as early as possible in order to achieve good results and prevent deterioration and the development of other conditions. Except in cases of suspected strabismus, hypermetropia under 2D and astigmatism under 0.75D was not corrected; in all other cases correction was made, the conditions being referred to as gross errors of refraction.

We are not concerned here with the finer analysis of the degrees of the errors of refraction and their age distribution; this is of secondary importance to this investigation.

The sight of children is usually examined when they are 7 to 8 years old by the Snellen type test in the course of routine medical inspections. Before this age treatment may be sought only when attention is drawn to the child's eyes by the occurrence of squint or because defective vision is thought to exist. A squint of the ordinary concomitant type associated with hypermetropia is usually manifest between the ages of 18 months and 5 years. At the age of 12 months a child should have acquired the power of fixation. Now, if something prevents that being acquired, nystagmus will occur, but during the next few years the full visual acuity will have to be developed. In cases of a high degree of astigmatism a distinct image is not formed on the retina and full visual acuity cannot be developed. Also with anisometropia the child will not focus the ametropic eye and the same will follow.

It is therefore of great importance that such conditions should be recognized as soon as possible, since by correcting such errors at the earliest opportunity the final result will be much better. After the age of 8, if no correction has been carried out, there will be in these cases a considerable degree of amblyopia, which may be difficult or impossible to overcome. Furthermore, by correcting high degrees of hypermetropia many cases of potential squint may be forestalled. Experience has also shown that if one child in a family has a gross error of refraction it is likely that some of the other children will also have errors requiring correction, and it is the custom of one of us (T.W.L.) to inquire into family histories and to examine all the children of a family in which one child is found to have a gross error of refraction.

The number of cases of amblyopia discovered in school entrants indicates that a far more intensive investigation should be made of the eyesight of the pre-school child. Some special test, easily applied and quickly performed, is required to ascertain those children who are suffering from grosser errors of refraction. One of us (P.A.T.) undertook the retinoscopy examination of all children present in the day nurseries, nursery schools, and classes in the borough.*

Method and Scope of Eye Investigation

Retinoscopy was performed with a plane mirror without using a mydriatic. The children were examined in a darkened room seated on a chair at arm's length. First the movement of the red reflex was noted in vertical and horizontal meridians. Movement against the mirror in any meridian in either eye was noted as "myopia" and referred to one of us (T.W.L.) for further examination. If movement occurred with the mirror then the procedure was repeated using a +2D lens held in turn immediately in front of the child's eyes, movement in any meridian in either eye being noted as "hypermetropia" and referred for further examination. It was found that having the children attend in batches of ten alleviated anxiety and that it was possible to examine 60 children in the course of an hour.

The upper age limit was taken as the age of 5 in January, 1949. Accommodation for 567 children exists in the day nurseries, nursery schools, and classes. Owing to illness and other reasons 87 were absent at the time of the survey and 10 became too emotionally disturbed to be examined. Of the 470 children examined, 10 were excluded from the final results, eight being over the age of 5 and two who were ascertained to have defects failing to keep several appointments for further examination. The results of the remaining 460 examinations are considered here.

Results

Table I shows the analysis by sex and age of the examinations made. The numbers in the age groups are considered too small for further analysis. The 460 children comprised 247 boys and 213 girls, and in each case 19

*We wish to acknowledge our indebtedness to Dr. G. Hamilton Hogben, to the borough education officer, and to the head teachers and matrons of the nursery schools and classes and day nurseries in Tottenham for their invaluable assistance.

TABLE I.—*Analysis of Results by Age and Sex*

Age Groups (Years and Months)	Boys							Girls							Totals for Both Sexes							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	No. with No Defects by Retinoscopy	No. with Uncorrected Defects by Retinoscopy	No. Confirmed by Specialist as Having Uncorrected Defects	No. with Refractions Corrected at Time of Survey	Total with Defects (Columns 3 + 4)	Total with No Defects	Total No. Examined	No. with No Defects by Retinoscopy	No. with Uncorrected Defects by Retinoscopy	No. Confirmed by Specialist as Having Uncorrected Defects	No. with Refractions Corrected at Time of Survey	Total with Defects (Columns 10 + 11)	Total with No Defects	Total No. Examined	Total with No Defects by Retinoscopy	Total with Uncorrected Defects by Retinoscopy	Total Confirmed by Specialist as Having Uncorrected Defects	Total with Refractions Corrected at Time of Survey	Total with Defects (Columns 17 + 18)	Total with No Defects	Total Examined	Percentage in Each Age Group with Defects
18 m.–2·0	18	1	1	0	1	18	19	7	1	1	0	1	7	8	25	2	2	0	2	25	27	7·4
2·1–2·6	19	0	0	1	1	19	20	12	1	1	0	1	12	13	31	1	1	1	2	31	33	6·0
2·7–3·0	12	1	1	0	1	12	13	10	2	2	0	2	10	12	22	3	3	0	3	22	25	12·0
3·1–3·6	23	1	1	0	1	23	24	37	2	2	1	3	37	40	60	3	3	1	4	60	64	6·25
3·7–4·0	31	1	1	1	2	31	33	33	3	1	2	3	35	38	64	4	2	3	5	66	71	7·0
4·1–4·6	58	5	4	2	6	59	65	43	5	4	2	6	44	50	101	10	8	4	12	103	115	10·0
4·7–5·0	64	8	6	1	7	66	73	49	2	2	1	3	49	52	113	10	8	2	10	115	125	8·0
Totals	225	17	14	5	19	228	247	191	16	13	6	19	194	213	416	33	27	11	38	422	460	8·26

visual defects were discovered—i.e., 7.7% and 8.9% respectively, with an overall percentage of 8.26. The number of children who were already receiving treatment for defective vision at the time of the investigation was 11 (five boys and six girls), or 2.39%. A further 33 cases were revealed by the survey; of these, 27 were later confirmed—i.e., 5.87%.

Table II provides an analysis of the defects found.

TABLE II.—*Analysis of Defects*

Conditions	No. of Uncorrected Cases	No. of Corrected Cases
Compound hypermetropic astigmatism ..	13	4
Convergent strabismus; compound hypermetropic astigmatism	4	7
Low hypermetropia	5	0
Myopia	2	0
Mixed astigmatism	2	0
Simple hypermetropia	1	0
No significant error	6	0
Totals	33	11

Conclusion

The results of this investigation are to be regarded as a "pilot" survey. Children attending nurseries may not be representative of the whole child population in the age groups examined. Further, a retinoscopy examination without the use of a mydriatic cannot give entirely accurate information about the state of the ocular mechanism. The method employed was devised and used as a simple and speedy technique to discover grosser errors of refraction. Despite its limitations it is contended that the method is justified and suitable for use on a wide scale in the annual examination of children of pre-school age.

Dr. Leonard Scheele, Surgeon-General of the U.S. Public Health Service, is reported to have stated recently that 1949 will be the worst year for infantile paralysis in the history of the United States, with cases reaching a total of 40,000 to 45,000. This will be a 50% increase over the infantile paralysis cases reported last year, and he feared that figures may be even higher next year and in the years to come. In the 10 years before 1943 there was only a moderate incidence of infantile paralysis in the U.S.A., but since then there has been a marked upward trend.

ACUTE ADRENAL INSUFFICIENCY AFTER ADRENALECTOMY FOR PRE-PUBERTAL VIRILISM

BY

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The following case is reported because it must represent closely the results of total extirpation of the adrenals in man.

Case Report

A girl aged 6 was found to be suffering from typical prepubertal virilism when first seen on November 8, 1944. The urinary 17-ketosteroid excretion was 12.3 mg. a day. Laparotomy was performed; this confirmed her sex and showed both adrenals to be much enlarged. Left adrenalectomy was carried out and the ketosteroids fell to 8.3 mg. a day. Her physical condition, however, did not improve, and her psychological condition became so difficult that her parents found it impossible to manage her. She was therefore readmitted at the age of 9½ for further treatment.

Although her general appearance was that of a normal girl of this age there was marked enlargement of the clitoris, and the vagina was rudimentary. A heavy growth of pubic hair was present. Her mental ability was only that of a child two years younger, and she behaved in an excessively rowdy way. Her voice was unusually deep. The urinary 17-ketosteroids were now 26 mg. a day.

The right adrenal gland was explored on February 20, 1948, and found to be about five times the normal size. A portion 1½ by 1 in. (3.75 by 2.5 cm.), representing just under half the gland, was resected with the diathermy needle and the cut edge of the remainder of the gland oversewn with catgut. The wound was closed without drainage. A small wound was accidentally made in the pleura; it was immediately closed. An intravenous glucose-saline drip was started.

Ten hours after operation her condition was quite satisfactory and the intravenous drip was discontinued. But the pulse and respiration rates began to rise during that night, and by 24 hours after operation the blood pressure had fallen to 75/45, her pulse was weak and rapid, and she was drowsy but rational. She was sweating slightly and her skin felt warm. It was now noticed that generalized pigmentation of the skin was developing. As the day went on she became noisy and restless, and her temperature rose to 103° F. (39.4° C.). A right-sided

pneumothorax was present. Two 10-ml. doses of "eucortone" were given during this day, but had little noticeable effect. During the night her condition became steadily worse. The blood pressure remained at 75/45, and her pulse became irregular and at times uncountable at a rate of about 180 a minute. The respiration rate rose to 60 a minute. She was delirious and incontinent of urine.

On the morning of the second day after operation her condition was so grave that the ward sister thought she was not likely to live for more than an hour. The pulse was uncountable and the respiration rate still 60; the blood pressure was now only 50/20. A deep generalized pigmentation of the skin was present; it was of café-au-lait colour and evenly distributed over the whole body. Nevertheless, her ears and lips remained a good pink colour and the pale grey-blue cyanosis seen in cases of severe shock—e.g., after severe burns—did not develop. The haemoglobin was 55%, so it was evident that the haemoconcentration of shock was not developing.

She was given 10 ml. of eucortone intravenously, and one hour later her general condition was noticeably better. A further 15 ml. was therefore given immediately, and further improvement followed. An intravenous glucose-saline drip was started again and eucortone, 30-ml., was introduced with it four-hourly. During the day she vomited several times, but the total amount brought up in the post-operative period could not have been more than 1 pint (568 ml.). She passed no urine, and by the evening oedema of the face, particularly about the eyelids, was beginning to develop. She was catheterized, but only about

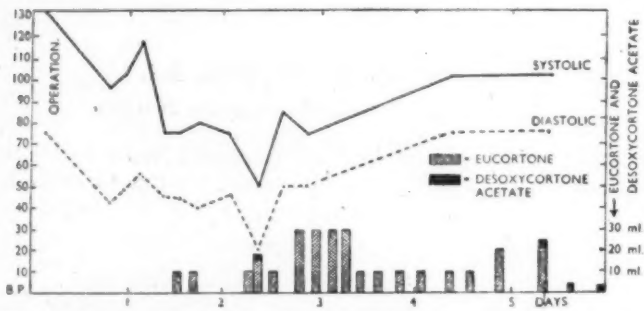

Chart showing blood pressure and the course of adrenal cortex replacement treatment.

50 ml. of urine was obtained. This was of average concentration and contained albumin but no sugar or ketone bodies. The urinary chlorides were 3 g. per 100 ml., and a blood sample taken at the same time contained only 292 mg. of sodium per 100 ml. (normal 325 mg.).

Her condition continued to improve during the night, though she was noisy and delirious and required heavy sedation. By the next day, the third after the operation, the blood pressure was rising and the pulse and respiration rates were falling. There was marked oedema of the face but none of the limbs or sacral area. She began to take fluids by mouth and passed 30 oz. (950 ml.) of urine. On the fourth day she was rational and sleepy, and her general condition had very much improved. She was taking food by mouth, and the blood pressure had risen to 102/75. The oedema was subsiding, but the pigmentation still remained.

From then onwards she made rapid progress. The eucortone was reduced to 10 ml. four-hourly on the third day after operation, and she was given 20 ml. on the fourth; it was stopped altogether on the fifth day, and desoxycortone acetate, 2 ml. (10 mg.) was given thrice daily for five days followed by 2 ml. daily for two days. Common salt, 6 g. daily, was given while she received desoxycortone acetate. The oedema had disappeared by the sixth day. The pigmentation gradually faded; it had become faint by the eighth day and had disappeared by the sixteenth, by which time she was afebrile and in excellent health. The total amount of eucortone given was 275 ml. The urinary ketosteroids on March 16 were 8.4 mg. a day.

Discussion

It will be seen that, three years after one adrenal had been removed, resection of about half of the remaining gland was followed by a crisis similar to those which occur in Addison's disease. It did not occur immediately after the operation, but began within 12 hours of it. It is presumed to have been due to defunctioning of the remaining part of the gland by oedema, with the added possibility of thrombosis of the adrenal vein by the diathermy used in the excision.

Pigmentation occurred within 24 hours of the operation and was maximal within 48 hours of it; it was generalized and even, and in colour and depth closely resembled that of known cases of Addison's disease which were in the ward at the time. It had almost disappeared eight days after the operation. This was the most striking feature of the crisis.

The pigmentation of Addison's disease has been accounted for as follows. Adrenaline is normally prepared in the adrenal medulla from tyrosine, which is stored in the skin. If the adrenal medulla is destroyed and no adrenaline is formed the tyrosine is not used up and accumulates in the skin, where a tyrosinase converts it into melanin (Wright, 1945). The fact that pigmentation occurred so rapidly in this case seems to support the theory that adrenaline is secreted continuously in man.

The patient's condition during the crisis was rather like that in surgical shock, but the extremities remained warm and pink instead of cyanosed, and there was marked hyperventilation. The whole clinical picture resembled the Waterhouse–Friderichsen syndrome closely, but no petechiae were present, livid cyanosis did not occur, and she responded well to treatment with adrenal cortex extract (Martland, 1944). The pigmentation seen in this case has not been described in either of the above-mentioned conditions.

Summary

A case of pre-pubertal virilism is described; it was treated by adrenalectomy, followed later by removal of part of the remaining adrenal gland.

A crisis resembling those of Addison's disease occurred during the first few days after the second operation; it responded well to treatment with eucortone, desoxycortone acetate, and intravenous glucose-saline. Recovery followed.

I wish to thank Mr. L. R. Broster for permission to publish this case and for his help in preparing the paper.

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In future national insurance cards will not be stamped by patients in mental institutions or by the staff of the institutions on the patients' behalf. The Ministry of National Insurance will not ordinarily examine liability for contributions until after a patient's release, unless the next of kin wishes to pay or an application for benefit is made. These arrangements have been agreed by the Ministries of Health and National Insurance, and are conveyed to mental institutions in Circular 95/49. The insurance cards should be returned to the local national insurance office, which will issue to the institution a form for each patient instead of a card. If the patient is transferred to another institution the form should accompany the patient, and on the patient's discharge or death it should be returned to the local office named on the form. The next of kin of the patient or the person to whom correspondence about the patient is sent will have an opportunity of paying national insurance contributions on the patient's behalf if he wishes to do so.

Medical Memoranda

An Operation for Femoral Hernia

The discussion on femoral hernia in the *British Medical Journal* of October 23 and November 6 and 13, 1948, has prompted me to describe, before I intended doing so, a method of closing the femoral canal which I have been using and which I think fulfils all the requirements of an operation for femoral hernia. In it no foreign unabsorbable material is used, with the occasional disappointment which this sometimes engenders. (Patients seem more disgruntled at having a chronic sinus from foreign material than if they had had a recurrence.) The canal is closed at the inlet by a living membrane that is always at hand. Very large openings are easily closed by this means.

The method puts no strain on the external oblique muscle. Any method that pulls down the inguinal ligament to Cooper's ligament in the high operation, or to the pectineal fascia in the low-type operation, produces a strain on the external oblique tendon and is often followed by rupture of the fibres here and a weakening of the inguinal canal. Hence the tendency to inguinal hernia after high or low operations in which the inguinal ligament is pulled down to one of these structures. When I have used the method here described there has been no subsequent discomfort.

Technique

I recommend the method for trial as I feel that no individual surgeon sees a sufficient number of femoral herniae in a limited time to appraise a method fully. The operation can be done with comfort for the patient and surgeon under local analgesia. A point in the simplification of the operation is the use of the Trendelenburg position.

The most satisfactory skin incision is one over the inguinal canal and curving down over the femoral sac at its inner end. This allows a good vision of the inguinal canal area and of the sac and the pectineus muscle with its coverings.

The sac is accurately freed from the surrounding fat and fascia; if large, the redundant part of the sac should be excised to facilitate the sac's being drawn up through the canal. The external oblique muscle over the inguinal canal is then incised as in inguinal hernia. The cord or round ligament is drawn up, the transversalis fascia is incised, and the extraperitoneal fat is exposed. The neck of the sac entering the femoral canal is gently pulled on, and by careful teasing the whole sac is pulled up from the femoral canal. The bladder is carefully separated from the sac on the inner side and a high closure of the sac made. The ligated portion and peritoneum are now pushed upward and the ileopectineal line, with Cooper's ligament, is exposed. A good exposure is obtained with the Trendelenburg position.

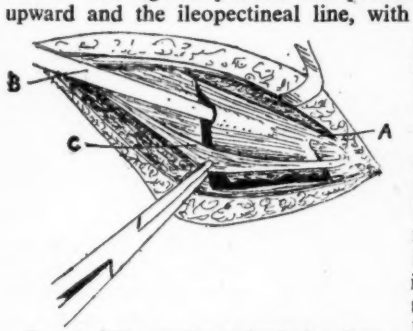

Fig. 1.—The pectineal fascia has been separated from the underlying pectineus muscle and is ready to be drawn upwards above the inguinal ligament. A = Superior ramus of pubes with Cooper's ligament. B = Blunt dissector raising fascial flap. C = Inguinal ligament.

Cooper's ligament extends down over the pectineus, where it blends with the pectineal fascia. The fascia is exposed from the ileopectineal line above to below the inguinal ligament by gentle wiping with a gauze swab. The medial border of the iliac and femoral veins is noted. This gives the outer border of the fascial leaf to be utilized and defines the breadth of fascia to cover the opening of the femoral ring. The fascia is incised along this line from Cooper's ligament to below the inguinal ligament, and the fascia is separated from the bone and underlying pectineus muscle by blunt dissection.

The fascia is cut across about ¾ in. (1.9 cm.) below the inguinal ligament. It can now be pulled upwards so that it hangs freely above except where it is hinged at Cooper's ligament (Fig. 1). This flap, which is naturally strong, is then laid without tension along the upper concave edge of the inguinal ligament and fixed here with two or three interrupted 40-day catgut sutures (Fig. 2). This effectively blocks the upper opening of the canal. The transversalis fascia is sutured accurately back in position and the external oblique muscle incision closed (Fig. 3).

Fig. 2.—The flap of fascia has been pulled up and is ready to be laid upon the upper surface of the inguinal ligament.

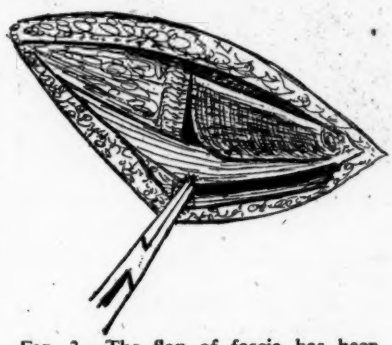

Fig. 3.—The flap of fascia has been stitched to the upper concave edge of the inguinal ligament.

Comment

Since writing this short description of an operation for femoral hernia I have read A. K. Henry's article (*Lancet*, 1936, **1**, 531) where he suggests an operation in which he uses the pectineal fascia in much the same way for the closure of the upper orifice of the femoral canal. Unfortunately, his unusual mode of approach has evidently overshadowed the suggested method of closure of the canal, for it has not been mentioned in any of the recent articles on the subject, and this short description is published with a view to popularizing this method of closing the canal. Henry's method of approach does not give a good view of the pectineal fascia and renders the operation difficult. The most satisfactory incision is the one I have described.

G. D. F. McFadden, M.Ch., F.R.C.S.

Branchial Fistulae

Proximally blind lateral cervical fistulae opening in the vicinity of the anterior border of the sterno-mastoid, and extending a variable distance up the neck, are not uncommon. Apart from their persistence and occasional discharge, they cause little disability, and where excision is indicated the procedure is simple provided their origin lies external to the carotid sheath. Consideration of the development of the visceral arches confirms the view that these branchial fistulae are probably derived from the cervical sinus, which in the embryo is normally shut off from the pharynx by a septum of tissue, the cleft membrane. Consequently the presence of a complete fistula communicating internally with the pharynx and presenting an external opening in the neck may be considered a rare condition.

Case Report

The case is that of a girl aged 16 who complained of a small discharging sinus in her neck. She stated that to her knowledge it had been present since birth, and that periodically it became more noticeable and discharged a clear coloured fluid for several days.

On examination a barely noticeable papule was present over the anterior border of the left sterno-mastoid and situated about 2 in. (5 cm.) above the suprasternal notch (Fig. 1). There was no discharge at the time, and it was found impossible to get a very fine probe into what was apparently a closed punctum. However, extending upwards from this towards the angle of the jaw was a slight but just visible cord-like thickening comparable in diameter to an ordinary lead pencil. On asking the patient to open her mouth and upon milking this thickening upwards, a good teaspoonful of whitish fluid was seen to exude from the region of the supratonsillar fossa.

FIG. 1.—Opening of branchial cyst in neck.

Under anaesthesia and after packing off the pharynx, a large ureteric catheter was passed with ease through a visible ostium opening above the left tonsil. Lipiodol was injected, and a subsequent radiograph (Fig. 2) confirmed the provisional diagnosis of a complete branchial fistula communicating with the pharynx.

FIG. 2.—Lateral view of fistula after injection of lipiodol.

Comment

Surgical ablation of such a fistula entails a moderate-sized incision and a careful dissection in the region of the internal carotid artery, due respect being given to the proximity of both the glosso-pharyngeal and the facial nerves. Access to the pharyngeal closure of such a fistula is best aided by lateral displacement of the tonsil by means of a finger in the mouth. The mere presence of a branchial fistula is in my opinion no indication for surgical intervention, and certainly before the latter is contemplated the extent of the tract at least should be investigated.

I wish to thank Dr. G. A. Borthwick, superintendent of the Northern Hospital, N.21, for permitting me to publish this case.

WILLIAM ROTHWELL, F.R.C.S., F.R.C.S.Ed.

Hyperpyrexia Complicating Infantile Eczema

Cases of sudden death in patients suffering from infantile eczema have been reported from time to time. Schwartz (1934) reviewed 10 such cases, and Feer (1904) reported others. These deaths seem to have been due to intercurrent infections, such as septicaemia, bronchopneumonia, or gastro-enteritis, which have run a more rapid course in these children than is usual. None of these appear to resemble the following case.

Case Report

The patient, a boy aged 13 months, had suffered from eczema since birth. On admission he had large patches of eczema, partly impetiginized, covering the greater part of all four limbs, the trunk, the face, and the scalp. The skin was treated with compound zinc ointment, and chloral was given by mouth to allay restlessness. The eczema improved greatly during the first week. The skin, however, became dry and showed powdery desquamation.

On the eighth day after admission a convulsion occurred, together with vomiting, pin-point pupils, and the passage of faeces. The skin felt extremely hot, and on taking the temperature in the rectum the mercury reached the end of the thermometer. Repetition with a second thermometer produced the same result. Both were subsequently tested, and the temperature required to bring the mercury to the end of the thermometers was found to be 110° F. (43.3° C.). Tepid sponging was started immediately, and the temperature was plotted every fifteen minutes. After half an hour the temperature was 106° F. (41.1° C.), and after one hour 104.8° F. (40.45° C.). Consciousness was regained four hours from the onset of the convulsion. The temperature was then 100° F. (37.8° C.).

Investigations were carried out to exclude intercurrent disease. The E.S.R. was 12 mm. in one hour. The urine showed a trace of albumin, but no abnormality was found in the C.S.F., the differential white cell count, or in the *x*-ray picture of the chest.

Progress was uneventful. A low-grade pyrexia persisted, but the eczema cleared except for a small patch on the shoulder. At the time of writing, eleven months later, the child is still attending as an out-patient. His skin remains dry and there are a few eczematous patches.

Comment

Hyperpyrexia is a possible and dangerous complication of infantile eczema in which a large proportion of the body surface is involved. In this case the combination of hyperpyrexia, pin-point pupils, convulsions, and unconsciousness also raises the possibility of a pontine lesion. Vasomotor spasm in the pons offers a reasonable explanation of the transitory nature of the signs.

Gratitude is expressed to Dr. F. A. Bryning, medical superintendent of Hackney Hospital, for permission to publish this case, and to Dr. F. L. Lydon, consultant dermatologist, for advice on its presentation.

E. MACLEAN POULTON, M.R.C.P., D.P.H., D.C.H.,
Hackney Hospital, London.

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Reviews

TOPICS IN BACTERIOLOGY

Bacterial and Mycotic Infections of Man. Edited by René J. Dubos, Ph.D. (Pp. 785; illustrated. £2 5s.) Philadelphia and London: J. B. Lippincott Company. 1949.

Microbiology and Man. By J. Birkeland, Ph.D. Second edition. (Pp. 525; 54 figures. £1 7s. 6d.) London: Baillière, Tindall and Cox. 1949.

Bacterial Metabolism. By Marjory Stephenson, Sc.D., F.R.S. Third edition. (Pp. 398; illustrated. £1 10s.) London: Longmans, Green and Company. 1949.

A galaxy of celebrities—thirty-four in all—has contributed to *Bacterial and Mycotic Infections in Man*, edited by Dubos, which is perhaps the most important new work of its kind for many years and is already to be found in many laboratories in the U.S.A. So much has happened in bacteriology recently that the revision of older books is an unsatisfactory process, and entirely new accounts, written by leading authorities from fresh viewpoints, have emerged to present their subjects in a new light. The most valuable parts of this book are thus the introductory chapters: by Dubos and Pappenheimer on the morphology and physiology of bacteria, by McLeod and Pappenheimer on the "properties of bacteria which enable them to cause disease," and by Francis on the "response of the host to the parasite." Other sections on allergy, immunity, and immuno-chemistry are equally useful There is also a chapter on blood groups, but why this should be included in a work on microbic infection is not clear.

The descriptive part of the book consists of twenty-four chapters, each describing a genus or group of micro-organisms. Other subjects discussed are the normal flora of mucous surfaces, sterilization, chemotherapy, epidemiology, and diagnostic proceedings, the whole being preceded by a full account from Murray of the history of the subject.

The pitfalls of multiple authorship have to a great extent been avoided. The book is coherent and nearly complete and the fullness with which each subject is treated is more or less uniform, although some authors, such as Conant, writing on mycoses, are lavish with their illustrations while others use few or none. Three genera not described are *Lactobacillus, Pfeifferella,* and *Fusiformis.* Possibly the first of these is excluded as non-pathogenic, but glanders and melioidosis are surely as important as *Bartonella* infection, and the various Gram-negative anaerobes sometimes classed as *Fusiformis* are interesting and frequent causes of infection and are rarely described adequately. It is perhaps unjust to criticize omissions in such a volume: it is neither a bench book nor a work of reference, but rather an educational book for the advanced student or the teacher. No reader will fail to profit from some of its stimulating pages.

The alliterative title of Birkeland's book *Microbiology and Man* suggests a popular work rather than a textbook. That it is intended for the use of students is expressly stated, but the nature and object of the course these students may be pursuing are not specified. Bacteriology is extensively taught in the U.S.A., both as a pure science and in its several applications to industry, and many textbooks in use there are intended for non-medical undergraduates and are consequently often unsuited to the needs of medical schools. Despite its extensive preoccupation with human disease, the proper function of this book seems to be to describe pathogenic species and their effects for the benefit of students whose main interests lie elsewhere. The descriptive middle section has a strong clinical bias, surprising in the work of a non-medical author, whose unfamiliarity with disease as such is occasionally betrayed—of typhoid fever he says that "there may be perforations of the intestinal tract followed by haemorrhage"; of anthrax, "if the abscess is opened and allowed to drain, healing may be fairly prompt"; and of cerebrospinal fever, "epidemics last two to three years." The introductory chapters on bacterial morphology and physiology are good, like the concluding ones on food, water, soil, and sewage; that on bacterial warfare is, perhaps fortunately, brief and non-committal.

Medical bacteriology has developed on utilitarian lines and uses methods of cultivation whose origin is empirical. Only in fairly recent times has the nutrition of bacteria been thoroughly studied, but there has now grown up a branch of the science with an imposing bulk of knowledge on this subject, using terms which the ordinary medical bacteriologist, unless he happens to be more than usually well versed in chemistry, may find hard to follow. A leading pioneer in this development was the late Marjory Stephenson, whose *Bacterial Metabolism,* much amplified in its third edition, is a standard work. It is indispensable to any inquirer in this field, and though concise and simply written is almost encyclopaedic in scope—the bibliography occupies 62 pages. The time is perhaps not far distant when the practical fruits of these fundamental studies will profoundly affect medicine as well as other spheres of applied bacteriology. Their results are already discernible in several directions, notably the rational approach to chemotherapy.

L. P. GARROD.

PRACTICE OF ANAESTHESIA

Modern Practice in Anaesthesia. Edited by Frankis T. Evans, F.F.A. R.C.S., D.A. (Pp. 566; illustrated. £2 10s.) London: Butterworth and Co. 1949.

Dr. Frankis Evans has succeeded in the difficult task of harnessing talented individuals to produce a well-balanced book. Here and there a tendency is noticed for a member of the team to steer his own course, but the general performance loses nothing by this occasional display of high-spiritedness. British anaesthetists may well be proud of this production by their London colleagues, and they will be prouder still when a few imperfections, some of them minor, are eliminated. If the editor re-reads one of his references (to Bier) he will no doubt correct some historical inaccuracies in the opening paragraph of his chapter on spinal analgesia. Fig. 25 is wrongly labelled, and the anonymous illustration No. 77 is worthy neither of the book in general nor of the excellent section on epidural anaesthesia in particular. The suggestion that carbon dioxide absorption technique must be used to achieve controlled respiration (p. 134) is a harmless inaccuracy, but the statement on p. 330 that 2% procaine is self-sterilizing is a serious blot. In addition to these factual errors, I believe the chapter on anaesthesia for bronchoscopy to be poor, and I found some of the whirligig diagrams of that admirable teacher, Dr. Galley, more inclined to confuse than clarify. I must confess to being allergic to pages of chemical formulae, and I believe it would be more in keeping with the sound common sense of the book to delete those unintelligible to anyone but a profound organic chemist—alternatively, if the full formula of *d*-tubocurarine chloride must be given on p. 81 there is no need to repeat it in full on pp. 82 and 212.

R. R. MACINTOSH.

A TEXTBOOK OF ORTHOPAEDICS

Essentials of Orthopaedics. By Philip Wiles, M.S., F.R.C.S. (Pp. 486; 7 coloured plates and 365 text-figures. £2 2s.) London: J. and A. Churchill. 1949.

Mr. Wiles has tackled the difficult task of telling undergraduates, junior residents, and general practitioners what is essential in orthopaedics—probably with the knowledge that not one of his colleagues in the same field would wholly endorse his choice of material. But there can be no doubt that he has been unusually successful and has produced a book that will prove popular because it so nearly achieves its object.

The arrangement of the chapters is unconventional. The author begins with a superb essay on the difficult and neglected subject of postural defects, and passes without any loss of continuity to another good chapter on pain in the back. This is followed by articles on disorders of the spine and the other joints. Here the trouble begins, for a regional approach inevitably leads to repetition in descriptions of conditions that may affect almost any joint, such as osteo-arthritis and tuberculosis. Even then the author finds it necessary to discuss these diseases in later chapters, in which he ties up the loose ends and is again repetitive. In writing a book of this kind the dilemma is perhaps insoluble, but it is probably best to stick to the old-fashioned plan of placing the general chapters before those concerned with regional topics.

The book contains a happy mixture of the author's own views with those of others. Mr. Wiles reveals himself as a good teacher; he speaks with authority from personal experience and at the same time shows his intimate knowledge of all that is significant in the world of orthopaedics. It is therefore unfortunate that his book is unadorned with detailed references to the many excellent papers from which he has chosen so wisely.

The book is pleasant to read; the reader finds himself carried along by language of engaging simplicity, so much so that it seems captious to criticize details. But a few examples must be mentioned—neuresthenia, haemophylia, aneurism, fusilade, and champfer are indications of lax proof-reading. Paget's quiet necrosis is not a synonym for osteochondritis dissecans, and the semilunar cartilages cannot be described as concentric. Most of the illustrations are excellent, though some of the radiographs and a few of the other pictures could have been better. The general quality of production is a great credit to the publishers.

The demand for the book is likely to be considerable. A second edition may soon be called for and the author will then have the chance of making his book unquestionably the best of its kind. If a reviewer may presume to give advice in an undertaking that is beyond his own capacity, I would suggest attention to the following points: rearrangement of the chapters; elimination of textual errors; verification of some techniques and opinions ascribed to other authorities; more references; and raising all the illustrations to the high standard the author has set himself.

H. J. SEDDON.

CARDIAC CATHETERIZATION

Cardiac Catheterization in Congenital Heart Disease. By A. Cournand, M.D., Janet S. Baldwin, M.D., and A. Himmelstein, M.D. (Pp. 108; illustrated. $4.00 or £1 2s.) New York: The Commonwealth Fund. London: Geoffrey Cumberlege. 1949.

It was a pleasure and a privilege to read this excellent atlas illustrating the value of cardiac catheterization in congenital heart disease. Part I, which is concerned with technique, describes the equipment required, the procedure, and the complications. Most of the possible positions of the catheter are shown, with graphs recording direct measurements of systolic and diastolic pressures within the various chambers of the heart. Formulae for working out the various shunts are given. Part II describes in detail 17 interesting examples of congenital heart disease investigated by catheterization.

It is fitting that the first book on the subject should be written by Cournand and his colleagues, who have been primarily responsible for developing the technique in the United States. The data offered should prove valuable to all workers in this field. A minor criticism is the lack of adequate electrocardiograms, only standard leads being shown. It is hard to believe that the catheter has passed through the tricuspid valve and through a ventricular septal defect in Fig. 12, the appearances being indistinguishable from those seen when the catheter has penetrated an atrial septal defect or foramen ovale and mitral valve. Again, it is odd that Case 2, said to be an example of idiopathic dilatation of the pulmonary artery, should have right bundle-branch block. More might have been written about the many technical difficulties it is possible to encounter during passage of the catheter, and how they may be overcome.

The illustrations are good, the diagrams are exceptionally clear, and the text is simple and concise. The authors are to be congratulated on an opportune and most helpful contribution to cardiology.

PAUL WOOD.

PRACTICAL PHYSIOLOGY

Human Physiology. By C. G. Douglas, D.M., F.R.S., and the late J. G. Priestley, D.M. Third edition. (Pp. 258. 18s.) Oxford: At the Clarendon Press. London: Geoffrey Cumberlege. 1948.

The first edition of this book appeared in 1927; owing to Dr. Priestley's death in 1941 Professor Douglas alone has been responsible for the present edition. As is well known, the work is based on the practical course in human physiology given in the Final Honour School of Physiology in Oxford. The exercises described deal with respiration, respiratory exchange and energy production, blood cells, plasma constituents, blood gases, certain aspects of the circulation, secretion of urine, and the examination of the alimentary canal in man. The instructions for carrying out the experiments are clear and detailed, and where necessary the calculation of arithmetical results is illustrated by examples. The new edition has been subjected to a careful revision, based partly on teaching experience and partly on the introduction of improved methods of investigation. Some interesting new experiments have been added.

The book is a model of its kind. It fulfils Professor Douglas's hope that "it will encourage the student in careful observation and accurate experimental work and afford him an introduction to the methods by which our knowledge of human physiology is being steadily increased." In many of the exercises the student is repeating the classical experiments by which the Oxford School of Haldane, Douglas, and Priestley established the fundamental facts about the control of many bodily functions in man.

The significance of the experiments is discussed at length. There is often a danger that a student might regard his practical work as a set of complicated parlour tricks which he must master to please his teachers and satisfy his examiners, but any student working conscientiously through this book will soon see that he is demonstrating for himself the truth of the principal affirmations made in his

textbooks, and that "theoretical" physiology is based on observation, experiment, and careful reasoning. Professor Pickering recently emphasized in the *Journal* the central place of physiology in the medical curriculum and the value of good practical courses on man in teaching the scientific method and outlook. Professor Douglas's book has for a generation been a major factor in helping to produce men capable of doing sound research; the new edition will be widely welcomed by teachers of physiology who have long recognized their indebtedness to this volume in planning their practical courses for medical and science students.

SAMSON WRIGHT.

A FRENCH MONOGRAPH

Physiologie du Système Nerveux Central. By G. Morin, Professeur de Physiologie à la Faculté de Medecine d'Aix-Marseille. (Pp. 270; 69 figures. 950 francs.) Paris: Masson.

This little book on the physiology of the central nervous system is attractive and useful. The subject has been treated in a novel manner which represents a physiological standpoint. The work starts with a consideration of the spinal roots and an outline of the autonomic system. The spinal cord is discussed as an organ of conduction and as a reflex centre: in the latter section the Sherringtonian principles of reflex action are introduced. The next chapters deal with muscular tonus and equilibration, the cerebellum, the cerebral cortex, the thalamus, the hypothalamus and the basal ganglia.

The diagrams are clear and the subject matter is up-to-date and logical. Such topics as the suppressor strips, the extrapyramidal tracts, and electroencephalography are described in reasonable proportion to the older matter. The author is non-committal regarding the location of the cortical area for taste, but inclines to the recent view that it is situated in the somatic face area. Two minor misprints may be pointed out: in Fig. 11 (p. 27) the indications of the crossed and direct pyramidal tracts have been transposed, and on p. 226 the words "shame rage" are given for "sham rage," possibly on account of the statement that this is "tantôt de type sexuel."

C. LOVATT EVANS.

Dr. Thomas Bedford's *Basic Principles of Ventilation and Heating* (pp. 401; 123 illustrations; 25s.; London: H. K. Lewis, 1948) is to a considerable extent based on the investigations made during the last thirty years by the author and his colleagues on behalf of the Industrial Health Research Board. Two of the earlier chapters describe the methods and apparatus used for measuring thermal environment. The chapter on warmth and comfort describes the opinions of 2,000 industrial workers employed under different atmospheric conditions, and the sections on ventilation describe in detail the measurement of natural air flow in dwellings and factories. There are several chapters describing the methods employed for warming houses and factories, and an excellent article on work at high temperatures. The book is well illustrated and has a good bibliography and index.

In *Sex in Social Life* (edited by Sybil Neville-Rolfe, O.B.E.; foreword by Sir Cyril Norwood; pp. 506; illustrated; £1 1s.; London: George Allen and Unwin, 1949), Drs. Waddington and Marshall have contributed chapters on the biology of sex and the physiology of reproduction, Professor A. E. Heath writes on psychology and sex, and Dr. Forbes on sex and the family in primitive society. These four provide an admirable scientific introduction. The sociologists who follow are on less established ground, and much of what they write is open to legitimate criticism. The reader will find sensible discussions on topics including sex education, family planning, sex in middle age, and prostitution. This book contains wisdom and practical guidance for dealing with many of the sexual problems in the life of the community.

BOOKS RECEIVED

[*Review is not precluded by notice here of books recently received*]

An Epitome of the Laboratory Diagnosis and Treatment of Tropical Diseases. By H. M. Shelley, M.R.C.P., D.T.M.&H. 2nd ed. (Pp. 147. 10s. 6d.) London: Staples Press. 1949.

The Group Approach to Leadership-Testing. By H. Harris, M.D. Foreword by General Sir Ronald Adam, Bt., G.C.B., D.S.O. (Pp. 288. 21s.) London: Routledge and Kegan Paul. 1949.

A Textbook of Bacteriology. By R. W. Fairbrother, M.D., F.R.C.P. 6th ed. (Pp. 484. 20s.) London: William Heinemann. 1949.

Diets for Sick Children. (Pp. 14. 1s.) London: The Hospital for Sick Children. 1949.

Practical Anatomy. By W. E. Le Gros Clark, F.R.C.S., F.R.S. 2nd ed.) (Pp. 493. 30s.) London: Edward Arnold. 1949.

Tuberculosis Nursing. By J. G. Eyre, S.R.N. (Pp. 291. 21s.) London: H. K. Lewis. 1949.

Short Manual of Regional Anatomy. By J. A. Keen, F.R.C.S. 2nd ed. (Pp. 164. 10s. 6d.) London: Longmans, Green. 1949.

Fitness for Games. By F. A. Hornibrook. (Pp. 39. 2s. 6d.) London: Research Books. 1949.

Bacteriology and Pathology for Nurses. By E. I. Clark, M.B., B.S. 2nd ed. (Pp. 320. 18s.) London: Faber. 1949.

A Life of John Keats. By D. Hewlett. 2nd ed. (Pp. 408. 25s.) London: Hurst and Blackett. 1949.

The Essentials of Chiropody. By C. A. Pratt. 2nd ed. (Pp. 177. 10s. 6d.) London: H. K. Lewis. 1949.

Dental Practice Management. By S. L. Drummond-Jackson. 2nd ed. (Pp. 370. 30s.) London: Staples Press. 1949.

Gray's Anatomy. Edited by T. B. Johnston, C.B.E., M.D., and J. Whillis, M.D., M.S. 30th ed. (Pp. 1,533. 84s.) London, New York, and Toronto: Longmans, Green. 1949.

Medical Clinics on Bone Diseases — A Text and Atlas. By I. Snapper, M.D. 2nd ed. (Pp. 308. 120s.) London and New York: Interscience Publishers. 1949.

Allergie 48. By E. Bernard, P. Blamoutier, and others. (Pp. 192. No price.) Paris: L'Expansion Scientifique Française. 1949.

Notions Pratiques d'Electrocardiographie. By P. Bardin and G. Mayonade. Preface by E. Donzelot. (Pp. 189. No price.) Paris: L'Expansion Scientifique Française. 1949.

Précis de Physiologie Pathologique Appliquée. Published under the direction of L. Heilmeyer. 5th ed. (Pp. 573. No price.) Paris: Vigot. 1949.

La Maladie de Bouillaud. By H. Grenet. (Pp. 176. No price.) Paris: Vigot. 1949.

La Ponction-Biopsie du Foie. By P. Cazal. (Pp. 106. No price.) Paris: Vigot. 1949.

Les Entretiens de Bichat, 1949. Chirurgie—Spécialités. Under the direction of surgeons and specialists of Bichat Hospital. (Pp. 436. No price.) Paris: L'Expansion Scientifique Française. 1949.

Les Entretiens de Bichat, 1949. Médecine. Under the direction of G. Laroche and L. Justin-Besançon. (Pp. 412. No price.) Paris: L'Expansion Scientifique Française. 1949.

Die künstliche Radioaktivität in Biologie und Medizin. By T. Bernet. (Pp. 83. 9s.) Vienna: Springer. 1949.

Die Therapie an den Berliner Universitäts-Kliniken. Edited by J. Brugsch. (Pp. 664. M. 24.) Berlin: Urban and Schwarzenberg. 1949.

Psychiatrie. By K. Kolle. (Pp. 443. M. 18.) Berlin: Urban and Schwarzenberg. 1949.

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ALCOHOL AND CIRRHOSIS OF THE LIVER

The theory, first suggested in this country by Addison[1] in 1836, that hepatic cirrhosis and alcoholism are aetiologically associated has for over one hundred years defied all attempts at proof or complete refutation. That alcohol is not the sole cause of cirrhosis was readily established by the occurrence of the condition in life-time teetotallers and in peoples and races who abstain from alcohol on religious or other grounds. Nevertheless many studies in Europe and America have pointed to an undoubted relationship between alcoholism and cirrhosis. Some animal experiments in the past have failed to reveal any unequivocal toxic effect of alcohol on the liver, though Opie's experiments indicated that the effect of combining bacterial infection with toxic agents was greatly to enhance toxicity. In the majority of experiments in which alcohol appeared to have a hepatotoxic action the result was not necrosis or fibrosis but only a fatty infiltration. In human cases, too, acute alcoholism was recognized as a cause of severe fatty infiltration, and as long ago as 1870 Trousseau[2] drew attention to fatty infiltration as a precursor of Laennec's cirrhosis and as a frequent finding in the early stages of cirrhosis itself. It is only in the last few years, however, that the significance of fatty infiltration in the genesis of cirrhosis has been appreciated. Moreover, although in well-nourished animals the liver fat can be increased by administering a variety of toxic substances, the degree of infiltration, with the exception of that caused by phosphorus, is comparatively slight and can rarely be made to exceed 15% of the wet weight. On the other hand, fatty infiltration causing gains in weight approaching 50% of the wet weight can be readily induced in animals by maintaining them on suitable diets.

The relation of diet to the fat content of the liver has been closely studied by Best and his collaborators[3] in Toronto and Channon in Liverpool. As a result of their work and that of others it became possible to classify dietary factors into lipotropic and alipotropic, the latter enhancing the deposition of fat in the liver and the former preventing it or facilitating its removal when present. Most important of the lipotropic agents is choline, the trimethylhydroxy derivative of ethanolamine. Methionine, one of the "essential" amino-acids, is also actively lipotropic by virtue of possessing a labile methyl group which can be utilized in the body for the synthesis of choline. The activity of choline is apparently due to its being required for the synthesis of the phospholipid lecithin, of which it is a part. Of the allpotropic agents cystine is the best known; it owes its activity, at least in part, to its stimulating effect on the growth of animals on low-protein diets. Both carbohydrate and fat are also alipotropic in that the greater the intake of these substances the more lipotropic factors are required to prevent an increase in the liver fat.

Connor,[4] who also drew attention once again to the stage of fatty infiltration in acute alcoholism, was the first to attribute aetiological importance to the fat in the subsequent development of fibrosis, his contention being that the distension of the liver cells caused interference with their blood supply and nutrition, with consequent injury and fibrosis. That fatty infiltration quite apart from alcoholism may lead to fibrosis, a necessary corollary of Connor's theory, was soon demonstrated, first in dogs submitted to pancreatectomy and maintained on insulin and later in otherwise normal dogs with livers made fatty by high fat diets. Meanwhile the discovery by Györgi and Goldblatt[5] that extensive necrosis of liver tissue could be a consequence of nutritional defects had tended to obscure the precise relationship between fatty infiltration and hepatic cirrhosis. This became clarified, however, when Himsworth and Glynn[6] were able to show that nutritional deficiency could cause two quite distinct hepatic lesions in rats—namely, massive necrosis and its sequel, post-necrotic scarring with nodular hyperplasia, resulting from thio-amino-acid deficiency; and fatty infiltration with its sequel—diffuse fibrosis (Laennec's cirrhosis) resulting from deficiency of lipotropic factors.

Animal experiments had therefore indicated that fatty infiltration was a stage in the development of cirrhosis, and that both alcoholism and nutritional deficiency caused fatty infiltration and were both to that extent cirrhogenic. The problem that remained to be answered was whether the fatty infiltration due to alcoholism was a result of a direct toxic action or merely the result of an associated nutritional deficiency which itself was the consequence of loss of appetite, gastritis, and poverty—common accompaniments of alcoholism. That the latter is the case is now shown by Best and

1 *Guy's Hosp. Rep.*, 1836, **1**, 476.
2 *Lectures in Clinical Medicine*, 1870, New Sydenham Society, London.
3 *Vitamins and Hormones*, 1943, **1**, 1.
4 *Amer. J. Path.*, 1938, **14**, 347.
5 *J. exp. Med.*, 1942, **75**, 355.
6 *Clin. Sci.*, 1944, **5**, 93.
7 *Brit. J. exp. Path.*, 1948, **29**, 1.
8 Waterlow, J. C., *Spec. Rep. Ser. med. Res. Coun.*, No. 263, 1948, H.M.S.O., London.

his colleagues, who describe the results of their experiments in the opening pages of this issue. Rats were maintained on a synthetic diet "as nearly adequate as possible with respect to all dietary components except the lipotropic factors." The latter were restricted to an extent which allowed the fat content of the liver to rise on average to 10%. Feeding alcohol to rats maintained on such a diet caused a reduction in appetite and hence a fall in calorie intake; this was partly compensated for by the calorie value of the alcohol itself. The average fat content in the livers of these animals rose to 20%, and in half of the animals fibrosis indicative of commencing cirrhosis was apparent. In "pair-fed" animals whose diets provided no additional calories comparable to those obtained from the alcohol no increase in fat or fibrous tissue was observed. When, however, the additional calories provided in the experimental group by the alcohol were provided in the control group by a supplement of sucrose, the results in the two groups were indistinguishable. Moreover in both groups the lesions were entirely prevented by increasing the intake of lipotropic agents either as choline, methionine, or casein. Thus so far as the liver is concerned alcohol is no more toxic than sugar, the deleterious effect of both resulting from an increased need for lipotropic agents in the diet. This well-conceived experiment thus answers the old question, Is alcohol toxic to the liver? The answer is, No; but a qualified affirmative could be given if it is explained that alcohol is only as toxic as a quantity of cane sugar of the same calorie value.

The implications of this not unexpected answer are important. It is imperative to ascertain whether the rat is typical of mammals in general in the response of its liver to alcohol and whether human beings behave in a similar fashion. It is also important to determine how much fat the liver can tolerate and for how long before fibrosis supervenes. Glynn, Himsworth, and Lindan[7] have recently shown that the critical stage is reached when the fat in the liver amounts to 15%; above this the rate at which fibrosis appears is proportional to the fat content. If the human liver behaves like that of the rat—and the indications are that it does[8]—the supplementation of all alcoholic liquors with a lipotropic agent such as choline should prevent that fatty infiltration which is apparently the indispensable precursor of so-called alcoholic cirrhosis. As Best suggests, this raises "scientific, moral, financial, and gustatory problems." Nevertheless the incidence of alcoholism in the United States may well warrant such an experiment there. In this country, at least for some years to come, our livers are more likely to suffer from primary dietetic deficiency of lipotropic agents than from deficiency due to an excess of saccharine or spirituous liquors.

GENERAL PRACTITIONERS AND HOSPITALS

State schemes are often justified by their supporters on the grounds that they co-ordinate services and thereby make them more efficient, yet in this respect the Health Service has failed, creating divisions where none existed before. The Minister of Health has recently shown that he is aware of the unfortunate inclination of some regional boards to expand the hospital service at the expense of the general practitioner service by excluding general practitioners from hospitals at which they treated their patients and staffing these hospitals with whole-time specialists. He has made it plain in a recent circular[1] that regional boards are not to dispossess general practitioners, and their patients, of "cottage" hospitals, to which, in the words of the circular, "general practitioners of the neighbourhood can admit patients who require treatment within the scope of a general practitioner but who, for various good reasons, cannot be treated at home." There is probably a good case for expanding the consultant services; there is none for impeding the general practitioner from ready access to hospital work. At the Annual Representative Meeting this year representatives drew attention to the problem and protested[2] against the steady exclusion of general practitioners from work in hospitals, and the Conference of Local Medical Committees, as we report in the *Supplement* this week, returned to the subject on October 27.

While regarding as sound the Minister's advice on the importance of maintaining cottage hospitals, the Conference agreed that local medical committees must watch vigilantly to ensure that his intentions are carried out. The powers delegated to regional boards give them an independence, an ability to respond to local needs, which is essential if the day-to-day administration of the Service is not to become a crossword puzzle to be solved in Whitehall. But the Minister is ultimately responsible for their activities; indeed, under Section 6 (4) of the Act he is bound in using hospitals transferred to him by the Act "so far as practicable" to "secure that the objects for which they were used immediately before the appointed day are not prejudiced by the transfer." If evidence is brought to his notice that a regional board proposes to deprive general practitioners of access to a cottage hospital he will no doubt see that his policy is enforced.

Many speakers at the recent assembly of the WMA. commented on the diminishing status of the general practitioner. Yet, as Dr. Fishbein pointed out, advances in therapeutics have greatly extended the general practitioner's opportunities to treat patients at home or in

[1] *British Medical Journal Supplement*, October 15, p. 168.
[2] Ibid., July 2, p. 1.

a cottage hospital. Refinement of therapy has brought new problems in diagnosis, and special tests that can be carried out only in a hospital or laboratory are often necessary to solve them. If the general practitioner is to make full use of modern drugs he must have access to the departments, particularly pathology and *x*-ray departments, where these investigations can be carried out. There are many occasions when reference to a consultant is unnecessary and time-wasting. Provided the facilities exist they should be available equally to consultants and general practitioners, and direct access is being granted to an increasing number of pathology departments. Consultants would probably welcome such an arrangement, for it should leave them free to play their proper part—that is, as consultants on difficult cases—and relieve them of work for which their special knowledge is not required.

If the great majority of labours are to be conducted by general practitioners and midwives, as they should be, hospital beds must be available to which women can be admitted and there delivered by the general practitioners themselves. This is more necessary now that many women are confined at hospital merely for social or economic reasons. In some places regional boards are said to have taken over a small hospital at which general practitioners formerly delivered their own patients, staffed it with whole-time obstetricians, and denied the general practitioners entry. Such fragmentation of the Health Service is to be deplored, for not only is it upsetting to the patient but it removes from the practitioner's care cases well within his ability.

With the knowledge that most medical students will become general practitioners the schools train them in clinical medicine, and it is a reasonable assumption that a general practitioner ought to be first and foremost a good clinician. When he finds that the trend in general practice is to impede him from exercising his clinical abilities the doctor is apt to be disconcerted, on complaining of this, to be told that general practice offers unrivalled opportunities for the prevention of neurosis or the practice of social medicine. Yet if general practitioners are to remain clinicians they must be closely linked with hospitals, enjoy ready access to their departments, and communication with their staff. There must be opportunity for the keen man to have charge of hospital beds as well as home beds, and he should be welcomed as a colleague who can supply useful information at the out-patient or *x*-ray department rather than looked at askance as an intruder. The Association has two committees studying the problem—one on general-practitioner specialists and the other on general practitioners as such in charge of hospital beds. They will have an important contribution to make to the smooth running of the Health Service and the maintenance of general practice as an interesting and honoured branch of medicine. Meanwhile it is up to general practitioners and their local representatives to ensure that the ground is not cut away from them by regional hospital boards in opposition to the Minister's intentions.

REHABILITATION OF THE TUBERCULOUS

During the war the prevention and limitation of illness and disability were matters of urgent national importance. Two ministries were active in helping persons out of work through physical disablement—the Ministry of Health, responsible through the hospitals for medical treatment and medical rehabilitation; and the Ministry of Labour, responsible for resettlement in suitable work and for vocational guidance and training. Rehabilitation and resettlement of the tuberculous should be an important part of the national effort to prevent the spread of tuberculosis and to help individuals to make a more lasting recovery as well as some contribution to production. But three factors at the present time hinder progress. The morbidity rate in England and Wales is slightly on the increase, and more so in Scotland, though indeed mass *x*-ray surveys and other improvements in diagnosis and case-finding may be partly responsible for this; hospital and sanatorium beds are far short of the number required for institutional treatment, which for most patients is the necessary first stage of rehabilitation; and there are too few houses available for tuberculous families. In spite, therefore, of the declared aim of the National Health Service Act to improve the speed at which patients are brought back to health and thereafter to work and of the opportunities provided by the Disabled Persons (Employment) Act, 1944, the number of tuberculous persons needing treatment and rehabilitation (believed to be some 30,000) tends to grow larger year by year. Elsewhere in this issue Dr. Frederick Heaf, writing from first-hand experience, discusses this problem and brings out four points of primary importance. First, it is impossible to be sure that a tuberculous person has completely recovered from his disability; secondly, there are no means of assessing a tuberculous person's capacity for work except by trial and error; thirdly, when the disease is active it is usually infective; and fourthly, the problems of financing rehabilitation and resettlement have not been effectively solved.

Patients notified as suffering from pulmonary tuberculosis fall into two groups: those who remain under observation for active disease, and those who are eventually classed as "recovered"—i.e., the disease has remained "quiescent" for two years and "arrested" for a further three years. An investigation in Lancashire[1]

[1] *Prevention and Treatment of Tuberculosis in the Administrative County of Lancaster*, 1945, T. Snape & Co., Preston.
[2] *Tubercle*, 1949, **30**, 74.
[3] *Lancet*, 1949, **1**, 563.

showed that out of all the patients diagnosed during any one year as suffering from pulmonary tuberculosis—with sputum positive, negative, or absent—70% receive institutional treatment, and some 60% will have died from tuberculosis during the following five years. Disquieting facts have also come to light about the patients classed as "recovered." Tattersall[2] found from a five-year follow-up of sputum-positive recovered cases that 10% of the patients deteriorated after an average period of six years as "recovered." It is such facts that have made many appreciate the advantages of the village settlement, with its post-sanatorium medical supervision and favourable living and working conditions. But only a very small number of places are available, and unfortunately there are many who cannot or who will not be admitted to these institutions. Perhaps in the future the rest, nourishment, regulated life, and medical supervision which these individuals require may be provided by the night sanatorium, with its 30–50 tuberculous persons fit for some industrial employment in special "Remploy" factories of the Disabled Persons Employment Corporation. In the assessment of a tuberculous person's capacity for work Grenville-Mathers[3] has recently devised a modification of the method which Brieger developed at Papworth. He uses a simple physical-efficiency index, but points out that it is mainly a guide for the non-medical officers of the Ministry of Labour. In fact he agrees with Heaf that "fitness for any occupation cannot be defined by physiological measurements alone."

The danger of infection from patients with active disease is of great consequence in industry. Heaf suggests that inherent resistance is the most important factor and that "after the primary infection has been overcome only large and repeated exogenous infections are of any danger." This, if true, has very important implications. It means that the tuberculous and non-tuberculous can be employed together—as is done successfully in some village settlements—provided the non-tuberculous have overcome their primary infection, are adequately nourished, and work under good hygienic conditions. But the difficulty of applying such conclusions, even if correct, is obvious. There is a great and increasing fear of tuberculosis among the general public, due on the one hand to propaganda about infection and on the other to the serious nature of the disease. Even if it is inherent resistance and not exogenous infection that matters after the primary infection has been overcome, fear of infection will long remain. The public should now be given information based on the most recent knowledge about the pathogenesis of the disease. According to Heaf the greatest difficulty of all in rehabilitation and resettlement is that of finance. No advances can be made if the tuberculous are employed without regard to their living conditions, but the maintenance of a high standard of living is expensive. Financial assistance is available, but the methods of obtaining it are confusing, for it is of one kind when the tuberculous person is a patient and another when he is being trained and prepared for re-employment. Only a few of the larger local authorities have so far accepted liability to maintain persons undergoing rehabilitation at industrial settlements as part of their obligations under Section 28 (2) of the National Health Service Act. Local authorities have here an opportunity to give a lead to the rest of the country, and it is to be hoped that they will not only be generous in giving financial help but will take active steps in other directions, such as by providing houses, to refit the tuberculous patient for life in the community.

BURNS AND BONFIRES

Each year the season of bonfires and fireworks brings to surgeries and hospitals patients with burns of all degrees and severities. Most of these accidents could be prevented if common-sense precautions were taken, but, however unnecessary the injuries may be, the doctor is presented with the problem of treating them. The three principles of the modern treatment of burns are fluid replacement, the prevention of sepsis, and skin grafting if the injury extends through the full thickness of the skin. Intravenous plasma or its equivalent is usually required for patients with burns of 15% or more of the body surface. The amount to be given varies with the individual case and should be regulated in the light of repeated haematocrit or haemoglobin readings.[1 2] The fresh burn is usually free from pathogenic infection; it is also an excellent culture medium, so that great care has to be taken to prevent access of organisms. The best first-aid treatment is therefore to apply a sterile or freshly laundered cloth. At the surgery full sterile precautions should be the rule, and operating theatre standards are required in hospital. Large burns are particularly vulnerable to air-borne infection, and therefore to give the patient the best chance dressings should be done in virtually bacteria-free air such as can be provided by air-conditioning. A good local application should be soothing and assist in the prevention and control of infection: a cream of penicillin in a "lanette wax" base, as recommended by Colebrook,[3] fulfils these requirements. It can be covered with gauze, outside which a liberal layer of cotton-wool provides a bacterial filter, equalizes pressure, and protects from further trauma. The pressure is best applied over the wool with crepe bandages, and the whole dressing should extend well above and below the injury. Such a dressing can usually remain in place up to 10 days. Should it become soaked with exudate it will cease to be an effective barrier against infection, and the dressing must be renewed.[4] Within seven to fourteen days

[1] Gibson, T., and Brown, A., *Spec. Rep. Ser. med. Res. Coun., Lond.*, 1944 No. 249. London: H.M.S.O.
[2] Cope, O., and Moore, F. D., *Ann. Surg.*, 1947, **126**, 1010.
[3] Colebrook, L., Duncan, J. M., Ross, W. P. D., *Lancet*, 1948, **1**, 893.
[4] —— Hood, A. M., ibid., 1948, **2**, 682.
[5] Cope, O., *et al.*, *Ann. Surg.*, 1947, **125**, 1.
[6] *Lancet*, 1949, **2**, 181.

superficial burns will be healed, and those a little deeper but with surviving epidermal cells will show islets of new epithelium. Burns extending through the full thickness of the skin, on the other hand, will never heal satisfactorily from below, and once diagnosed should be grafted as soon as possible.[5] Split skin grafts suffice for most burns treated early, and late secondary repair should be required only exceptionally.

The burns which occur on Guy Fawkes night are notable because they should be easily avoided, but study of the far more numerous everyday burns and scalds discloses the same story. In their recent analysis of 1,000 consecutive admissions to hospital for the treatment of burns the Colebrooks[6] point out that most of these injuries were preventable, and that in particular more attention should be paid to the disastrous results of clothes catching fire. The medical profession, since it is aware of these facts, has a responsibility to make them known and so to prevent these injuries occurring.

EARLY DETECTION OF CANCER

The only hope at present of improving results in the treatment of malignant disease lies in earlier diagnosis. The problem is a difficult one, being largely a matter of educating the public to report the early symptoms. In order to make it easier for patients some hospitals have established cancer diagnosis clinics during the past few years, and in fact over five hundred such clinics already exist in the U.S.A. Haagenson[1] has recently pointed out that what the patient needs is more courage and less fear; he makes the important observation that the propagation of information by cancer societies tends to alarm the patient so much that he is afraid to seek advice.

There is as yet no simple test for establishing the presence of a malignant tumour, and radiological and histological methods must suffice in the majority of cases. Haagenson reviews the diagnostic problem for each of the most common types of cancer. His general conclusion is that cancer can be divided into two classes: accessible and inaccessible. Accessible neoplasms include those of the breast, cervix uteri, skin, prostate, rectum, lip, and mouth, while neoplasms of the stomach, colon, lung, pancreas, and ovary are in the inaccessible group. The importance of this differentiation, in Haagenson's view, is that any trained physician should be able to make the diagnosis in the first or accessible group with no more equipment than would be expected in the general practitioner's consulting-room. Diagnosis of the inaccessible types is a different matter, since elaborate apparatus and complex procedures may be required. This differentiation into accessible and inaccessible types is further considered in relation to the question of establishing universally available cancer detection clinics. Reports from existing American clinics do not indicate that they have had great success in the detection of the inaccessible types of cancer; this is partly because routine *x*-ray examinations, such as would be necessary for the early diagnosis of cancer of the stomach and colon, are too expensive to be practicable. Haagenson's conclusion is that responsibility for the early diagnosis of all disease, including cancer, must remain with the general practitioner, and that it is he who must put the patient on to the right road for investigation and treatment. Haagenson is against the formation of special cancer detection clinics; in his opinion the important thing is to concentrate on improving postgraduate education in the latest methods of diagnosis of cancer.

There are many who will not agree with Haagenson's views. Although the general practitioner is not likely to miss the most obvious of the accessible cancers, those of the female genital tract present a separate problem. Specialized gynaecological knowledge is needed for their early diagnosis, and certain of the recent diagnostic methods, such as the vaginal smear, require great experience of a difficult technique. Maliphant has discussed the incidence of cancer of the cervix in a paper published recently in this *Journal* (June 4, p. 978), and in his opinion the routine examination of the apparently healthy is the only method by which cases of the disease could be discovered at a very early stage. But according to his estimate only one cervical cancer would be found annually in every 1,500 women examined, even if these came only from the more vulnerable section of the community—parous women aged 35–64. MacFarlane, Sturgis, and Fetterman[2] have reported the results they obtained over a 10-year period in a clinic designed to provide regular pelvic examination of presumably well women with a view to detecting cancer of the uterus. In this period eight cases of pelvic cancer, four of them growths of the cervix, were discovered and treated. A large number of benign pelvic lesions were diagnosed, many of them being inflammatory lesions of the cervix, the treatment of which, the authors believe, may be of great importance in preventing the subsequent development of cancer. They conclude that the greatest value of this work has been educational, in that a thousand women and their relatives and friends have been taught the value of periodic pelvic examination, and they suggest that every woman over the age of 30 who has borne a child should be examined once or twice a year if inflammatory lesions of the cervix are present.

POISONING BY FERROUS SULPHATE

The corrosive action of ferrous sulphate is largely dependent on its acidity. This may be countered by mixing with alkali in the proportion to form ferrous carbonate, or mineral acid may be avoided by the use of ferrous ammonium citrate. However, the absorption of iron from these two preparations leaves something to be desired, and it is a common practice at present to give iron as ferrous sulphate mixed with a small proportion of copper sulphate and manganous sulphate: the pill is coated with sugar and dyed green. This pill, which commonly contains ferrous sulphate gr. 3 (200 mg.), copper sulphate gr. 1/25 (2.5 mg.), manganese sulphate gr. 1/25, is widely used and causes no ill-effects in the majority of adults. It is not surprising, however, that young children should be attracted by such pills and take them in quantity when they have the opportunity. In this issue Dr. J. H. Prain (p. 1019) describes yet another case of fatal poisoning by these iron pills and refers to previous publications in this *Journal* by Thomson[1] and Forbes.[2]

[1] *Bull. N.Y. Acad. Med.*, 1948, **24**, 651.
[2] *J. Amer. med. Ass.*, 1948, **138**, 943.

[1] *British Medical Journal*, 1947, **1**, 640.
[2] Ibid., 1947, **1**, 367.
[3] Ibid., 1947, **2**, 201.

Five cases of poisoning have so far been recorded; in only one of these, that of a boy of 2 years who retained eight tablets, was there recovery. All these cases occurred in Scotland and the northern half of England, and it is likely that there have been other cases in this country which have not been reported. In the fatal cases the number of tablets taken was about thirty, and the ages of the children ranged from 11 months to 3 years and 3 months. Corrosive action on the stomach was observed in all the cases, the duodenum and small intestine being less affected. Prain found definite necrosis and fatty changes in the liver in his case and suggests that absorption of the iron may have taken place largely through the damaged stomach wall. Forbes demonstrated on animals that the toxic agent is ferrous sulphate and that the copper sulphate is present in too small a proportion to have appreciable toxic effect. Somers[3] has demonstrated that the acidity of the ferrous sulphate is important, and he found that Blaud's pill was far less toxic in rabbits than the same dose of iron as ferrous sulphate. Both Prain and Forbes quite rightly suggest that more care should be taken in warning the patient that this preparation is dangerous to young children. Possibly accidents might be prevented if the pills were made in a form less attractive to the eye, but a child who will suck matches headed with yellow phosphorus would scarcely be deterred from taking iron pills because they did not look attractive or taste sweet at first.

THE PRE-ERYTHROCYTIC STAGES OF PLASMODIUM FALCIPARUM

Pre-erythrocytic cycles have for some time been recognized as occurring in the various species of plasmodia infecting birds. In 1948 Shortt and Garnham[1] showed conclusively that a pre-erythrocytic cycle existed also in the case of the monkey malaria parasite *Plasmodium cynomolgi*, which resembles very closely the human parasite of benign tertian malaria *P. vivax*. Shortly afterwards, in a paper which appeared in this *Journal*, Shortt, Garnham, Covell, and Shute[2] demonstrated the pre-erythrocytic stage of *P. vivax* in the liver of a human volunteer. In a third paper Shortt and Garnham[3] described further experiments with monkey malaria and gave their reasons for the assumption that after establishment of the blood infection the exo-erythrocytic cycle is responsible for the production of relapses. The persistence of these exo-erythrocytic forms in the human liver is presumably the cause of the relapses which occur in *P. vivax* infections. *P. falciparum*, the causal agent of malignant tertian malaria in man, differs in certain ways from *P. vivax*, and there is no known monkey plasmodium which can be used as a working model. For this reason an experiment in man was absolutely essential if the pre-erythrocytic cycle of *P. falciparum* was to be demonstrated. In the preliminary communication which we publish on page 1006 Colonel H. E. Shortt, Professor N. Hamilton Fairley, Sir Gordon Covell, Mr. P. G. Shute, and Dr. P. C. C. Garnham have clearly demonstrated with the aid of a human volunteer, to whom they pay just tribute, the existence of a pre-erythrocytic stage of *P. falciparum* in the liver. The development of this previously unobserved form has been followed from 92 to 140 hours after infection. Although there are certain small differences in the appearance of the pre-erythrocytic stages of *P. falciparum*, *P. vivax*, and *P. cynomolgi*, all three parasites are closely related. It remains to be determined why *P. vivax* is so much more difficult to eradicate from the tissues than *P. falciparum*.

1 *Nature, Lond.*, 1948, **161**, 126; *British Medical Journal*, 1948, **1**, 192.
2 *British Medical Journal*, 1948, **1**, 547.
3 Ibid., 1948, **1**, 1225.

VITAMIN B_1 AND THE HEART

Cardiac irregularities associated with vitamin B_1 deficiency have been observed by several workers. In 1929 Carter and Drury[1] showed that the heart block occurring in pigeons fed on a diet of rice disappeared when atropine was injected or when the vagus nerves were cut. They concluded that the heart block was due to over-action of the vagal centres and not to any change in the heart itself. Wintrobe's[2] experiments in pigs had similar results. In eight out of nine pigs with thiamine deficiency the P-R interval was prolonged; two developed second-degree block and one complete heart block. Atropine caused the second-degree block to disappear in one pig and shortened the P-R interval in another. Thus in these pigs there was again evidence of excessive vagal activity. Other workers, however, have reported abnormalities in the heart itself: King and Sebrell[3] observed lesions, chiefly in the auricles, in 14 out of 24 rats. In pigs fed on a thiamine-deficient diet Follis and his colleagues[4] found dilatation of the heart and focal or diffuse necrosis of the myocardial fibres; again the early lesions were in the auricles. Pantridge,[5] who was led to the investigation after observing heart block in cases of beri-beri in British prisoners of war, has also demonstrated lesions of the auricle in pigs. Four animals deprived of thiamine developed heart block, and in two this was complete. Changes could be detected histologically in the auricular muscle and in the conducting system in the ventricles. Pantridge suggests that the metabolism of the auricular and ventricular myocardium must differ in some respects, and this is supported by the finding of Davies and Francis[6] that the distribution of glycogen, phosphocreatine, and adenosine compounds is very different in the two parts of the heart. Since gross deficiency of vitamin B_1 leads to pathological changes in the heart, possibly mild degrees of deficiency persisting over years may be a cause of similar abnormalities.

1 *J. Physiol.*, 1929, **68**, P. I.
2 *Bull. Johns Hopk. Hosp.*, 1942, **71**, 141.
3 *Pub. Hlth Rep., Wash.*, 1946, **61**, 410.
4 *Amer. J. Path.*, 1942, **19**, 341.
5 *Brit. Heart J.*, 1948, **10**, 252.
6 *Biol. Rev.*, 1946, **21**, 173.

The Nobel Prize for Physiology and Medicine has been awarded jointly to Dr. Walter Rudolf Hess and Professor Antonio Egas Moniz. Dr. Hess has been Director of the Institute of Physiology at Zurich University for the past thirty years. Professor Egas Moniz, of Lisbon University, is a distinguished neurosurgeon and was at one time Portuguese Minister of Foreign Affairs. He introduced cerebral angiography in 1927 and the operation of prefrontal leucotomy in 1936.

Dr. J. G. Scadding, F.R.C.P., will deliver the Bradshaw Lecture before the Royal College of Physicians of London (Pall Mall East, S.W.) on Thursday, November 10, at 5 p.m. His subject is "Sarcoidosis, with Special Reference to the Lung Changes."

REFRESHER COURSE FOR GENERAL PRACTITIONERS

THE USE AND ABUSE OF VITAMINS

BY

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During the past 40 years discoveries in medicine and related sciences have led to an immense improvement in the health, happiness, and efficiency of millions of human beings throughout the world. In no branch of science have more important advances been made than in nutrition. The fascinating story of the discovery of the vitamins, the dramatic changes produced by their deficiency, and the remarkable therapeutic effects which result when they are supplied to individuals who have been eating an inadequate diet have received great publicity in both lay and medical press. The imagination of all who have heard or read about these discoveries has been stimulated and captivated. It is not surprising therefore that there has arisen a demand for vitamin preparations which has led to their manufacture and distribution on an enormous scale. But there is little doubt that at present large quantities of these preparations are consumed by individuals who can expect to receive no benefit whatsoever from them, since they are not suffering from nutritional deficiencies. The medical schools of Great Britain must shoulder their share of responsibility for the continuation of this unsatisfactory state of affairs, since it indicates that many members of the medical profession must have received insufficient training as undergraduates or postgraduates in the science of nutrition. Better instruction is essential to enable doctors to assess properly the validity of the claims made for vitamin preparations in the advertisements with which they are daily bombarded, and to investigate adequately the dietetic history of patients they suspect of suffering from nutritional deficiency.

Confronted with a patient complaining of such symptoms as fatigue, lassitude, loss of appetite, irritability, or insomnia, which are repeatedly stressed in advertisements of vitamin preparations as being the stigmata of subclinical states of nutritional deficiency, there is danger of the doctor prescribing a vitamin preparation without first fully investigating the physical, social, and environmental factors that so commonly lead to similar subjective features.

General Considerations

(1) It should constantly be remembered that in Great Britain fully developed states of vitamin deficiency such as beriberi, scurvy, and pellagra are very rarely encountered. When they do occur they usually appear in individuals of a certain type—elderly persons, frequently males who live alone, and in people with abnormal mental states who are either unable or unwilling to eat a normal diet. They also arise as "conditioned" states of vitamin deficiency—as a result of gastro-intestinal disorders which lead to a failure in digestion and absorption, or from the increased demands which occur during pregnancy and lactation, rapid growth, or markedly increased metabolism.

(2) Food supplies at present available from rationed and unrationed sources in Great Britain are capable of supplying all nutritional demands, provided the individual has some knowledge of what constitutes a reasonably well balanced diet. This has been clearly established from our knowledge of the total supplies of food available for distribution, from studies of the consumption of food by large numbers of working-class families, and from public health statistics. The general practitioner, if adequately trained in the science of nutrition, is the proper person to give advice to the family on how to eat, when to eat, and what to eat.

(3) It is a well-established fact that, if an individual is eating a sufficiency of any vitamin, supplementation of the diet by a vitamin preparation will effect no benefit and is therefore wasteful and uneconomic.

(4) Although the dominant clinical features may suggest a deficiency of one particular vitamin, experience has shown that deficiency of a single nutritional factor is seldom present alone. Almost invariably the diet will be found to be lacking in several factors. The administration of a single or multiple vitamin preparation without correcting the diet as a whole will lead to little or no benefit. This finding has been noted by many observers, including myself. I found no beneficial effects from supplying a preparation of vitamin A and D to school-children whose diet was defective in several factors, including protein, minerals, and vitamins. The children were drawn from the poorest classes and were investigated during the years of depression between the two world wars. At about the same time, in another region of Scotland, excellent effects on the health and growth of a similar group of children resulted from supplying them with a pint of milk daily. The psychological effects of giving vitamin preparations were clearly demonstrated in the former experiment, since many of the school teachers concerned in the experiment reported dramatic benefits in children whom they believed to be taking vitamins A and D but who were in fact being given an innocuous preparation of arachis oil in capsules identical with those containing the vitamins. This clearly indicates the need for caution on the part of a doctor in accepting subjective improvement after the administration of a vitamin preparation as being necessarily due to the correction of a state of pre-existing nutritional deficiency.

(5) Recent advances in knowledge call for a reconsideration of the generally accepted standards of vitamin requirements for the maintenance of health. The proof that many vitamins are manufactured in the alimentary tract by bacterial syntheses is a discovery of the greatest interest and importance which largely explains the variable incidence of vitamin-deficiency diseases in individuals ingesting a similar diet. This fact also explains the difficulty in deciding what values should be accepted as desirable for the maintenance of health.

Information derived from studies of human volunteers living on a diet almost completely devoid of vitamins A and C (see references to Table) clearly shows that many months must elapse before symptoms or signs develop, and that clinical features will disappear completely on supplementing the diet with amounts of vitamins considerably lower than those formerly accepted as necessary. These investigations strengthen the view that the food supplies

TABLE

Vitamin	Recommended Daily Allowance	Therapeutic Dose	Foods of Special Value
Aneurin (vitamin B_1)	1–2 mg.	10–50 mg.	85% extraction wheat flour, oatmeal, peas and beans, eggs, meat and offal
Nicotinic acid	10–20 mg.	200–500 mg.	
Riboflavin ..	1–2 mg.	5–50 mg.	As above, and milk and cheese
Ascorbic acid (vitamin C)	30 mg.*	200–500 mg.	Fruits, esp. citrus, currants and berries; green vegetables, tomatoes, potatoes
Vitamin A ..	2,500 I.U.†	25,000–50,000 I.U.	Eggs, cheese, milk, butter, vitaminized margarine, liver, fatty fishes, green and yellow vegetables
Vitamin D ..	Adults: (?) 100 I.U.; infants, pre-school children, pregnant and lactating women: 400–800 I.U.	1,500 I.U. up to 100,000 I.U. in special cases	Eggs, milk, butter, vitaminized margarine, fatty fishes (Note the importance of sunshine in promoting the synthesis of vitamin D in the skin)

The following vitamins are not included in the Table because their place in human nutrition is not clearly established or because they are only used for the treatment of certain pathological states: Pyridoxin, pantothenic acid, biotin, para-aminobenzoic acid, folic acid, vitamin B_{12}, vitamin E, and vitamin K.

* A preliminary report by Vitamin C Subcommittee of the M.R.C. (*Lancet*, 1948, 1, 853).

† M.R.C. Special Report Series No. 264, 1949.

available to the people in Great Britain are more than adequate to meet the vitamin requirements of the population without supplementing them with vitamin preparations, provided a reasonably intelligent selection of the available foods is made.

Prescription of Vitamins

Vitamin preparations have been prescribed for:

(1) Supplementing the diet to make it optimal for growth and the maintenance of health.

(2) Treating so-called "subclinical" states of vitamin deficiency.

(3) Treating fully established "frank" vitamin-deficiency diseases.

Bearing in mind the general considerations discussed above, the practitioner should make the following investigations before prescribing vitamin supplements:

(1) Take a careful history and make a full physical examination to determine the presence or absence of subjective phenomena or objective signs indicating vitamin-deficiency states.

(2) Consider whether any clinical features discovered are due to emotional states or organic diseases which can produce symptoms and signs simulating closely those of subclinical and "frank" vitamin-deficiency states.

(3) Take a careful dietetic history to determine whether there is evidence to show that the patient has in fact been eating inadequate quantities of essential nutritional factors.

(4) If the clinical features are in keeping with the existence of a state of vitamin deficiency and yet the dietary history does not suggest it, a search should be made for causes which are known to enhance the requirements for vitamins—malabsorption from the intestinal tract, pregnancy and lactation, rapid growth, infections, and states of increased metabolism. If no positive evidence can be obtained that a direct or conditioned state of nutritional deficiency has preceded the onset of the clinical features under investigation, it is extremely unlikely that they are nutritional in origin and it is illogical to treat them with vitamin supplements. The case should be carefully reviewed with particular reference to the possibility of hidden organic disease and to the factors operating in the home and at work which lead to psychological symptoms simulating those of subclinical states of vitamin deficiency.

Vitamin Supplements

Vitamin supplements should therefore only be prescribed as follows.

(1) *For the Maintenance of Health.*—Since all the factors required for the maintenance of health can be obtained from the food supplies and the extra supplements available in Great Britain at the present time, there would appear to be no adequate reason for the widespread prescription of additional vitamin supplements. Common-sense instruction on what foods to eat regularly is all that is required. The Table indicates foods which are the main sources of the most important vitamins in human nutrition.

It should be remembered that the concentration of a vitamin in any article of food is not necessarily the main consideration. For example, watercress has a high content of ascorbic acid compared with potatoes, but, as most people eat no watercress or only a very small amount occasionally, the humble potato is a far more important source of the vitamin. Another point to remember is in connexion with the method and rate of extraction of flour from wheat now in operation in Great Britain. The present process has so greatly increased the consumption of the B vitamins as to have largely solved this particular nutritional problem which was of such great importance in pre-war days, when 70% extraction white flour was the main source of carbohydrate. During the war the importation of fats, fruits, and vegetables had to be greatly restricted, with the result that nutritional experts were gravely concerned about the possible development of disorders due to a deficiency of vitamins A and C. Fortunately no such development occurred. Since the end of the war, fruits, particularly citrus fruits, and green and yellow vegetables have been imported in large quantities. These foodstuffs are available to augment the intake of ascorbic acid and carotene during the winter and spring months when the home production of fruit and vegetables is at its lowest.

Feeding experiments in human volunteers suggest that the requirements of vitamins A and C for adequate nutrition have been overestimated in the past. Even the figure of 2,500 I.U. of vitamin A given in the Table is about twice the suggested minimum protective dose required by the average individual. Hence there is little doubt that all vitamin requirements can be adequately met at the present time from food supplies readily available.

If an individual is taking the following helpings of food it is difficult to believe that he could suffer from any vitamin deficiency.

(1) An average helping of meat, poultry, rabbit, offal, or fish daily.

(2) 1 to 1½ oz. (42.4 g.) of fat daily (butter, vitaminized margarine, or cooking fat).

(3) 1 egg or ½ oz. (14.1 g.) of cheese daily.

(4) ½–2 pints (0.28–1.1 litres) of milk daily (according to such factors as age or pregnancy).

(5) 1 large or 2 moderate helpings of green or yellow vegetables daily.

(6) 1 large or 2 moderate helpings of potatoes daily.

(7) 1 helping of fresh fruit twice or thrice weekly.

(8) As much bread, scones, and cakes made from 85% extraction flour as desired.

When an individual is submitted to nutritional stress vitamin preparations may justifiably be prescribed. Special provision has been made for these purposes in Great

Britain by the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council. Supplements of cod-liver oil and orange-juice and additional quantities of milk are provided for pregnant and lactating women, for infants, and for children too young for school. It is undoubtedly wise to give these supplements to children up to the age of 5, particularly in winter time, and to school-children who are growing too quickly or who have had severe febrile illnesses. For adults, vitamin supplements should be very rarely prescribed for the maintenance of health except when there exist the additional strains and stresses already mentioned which enhance the need for vitamins.

(2) *For the Treatment of Subclinical Vitamin Disorders.*—The diagnosis of states of subclinical deficiency of vitamins is based not on objective signs but on subjective features. Even with the help of laboratory tests which are not readily available to general practitioners (e.g., plasma determinations of vitamins and saturation tests), it is far from easy to be sure that the symptoms complained of are nutritional in origin. While some physicians think that subclinical deficiency states are extremely common in Great Britain at the present time, others hold there is little satisfactory evidence to justify this view. I believe that the frequency of such states has been much exaggerated. Monotony of the diet and the frustrations and restrictions accompanying post-war life in Great Britain probably account for most of the subjective features attributed to states of vitamin deficiency. If, however, after making the requisite investigations discussed above, the doctor concludes that there is a state of subclinical nutritional deficiency present, he should treat the deficiency by ensuring that the patient takes a properly balanced diet. If this is done there will be no need or justification for prescribing vitamin preparations except when there is clear evidence of the patient being submitted to one or more of the above nutritional stresses.

(3) *The Treatment of Established Vitamin-deficiency Diseases.*—As already mentioned, frank deficiency diseases such as scurvy, pellagra, and beriberi are rarely encountered in Great Britain at the present time. Careful investigation of any such case that may be encountered will almost invariably reveal multiple deficiencies of protein, minerals, and vitamins. Correct treatment accordingly demands that the diet as a whole should be carefully reviewed and made adequate in all respects. In addition, vitamin supplements should be given in the therapeutic doses shown in the Table until all symptoms and signs of deficiency have disappeared.

Conclusions

If the views expressed above are accepted, it follows that vitamin preparations should not be prescribed routinely for the maintenance of health or the treatment of subclinical states of vitamin deficiency; the best way of treating these conditions is by instructing the patient how to choose and prepare a well-balanced diet adequate in all nutritional factors. Supplements of vitamins are indicated only when causes are found to be operating which greatly increase nutritional requirements. Frank vitamin-deficiency diseases are rare in Great Britain; their treatment consists in correcting the diet in all respects and supplementing it with appropriate doses of vitamin preparations. Accordingly it is suggested that if more attention were given to the proper diagnosis of nutritional deficiency, to the taking of a careful dietetic history, and to the principles governing the prescription of vitamin preparations discussed above much unnecessary expenditure would be avoided. The discovery and elimination of social and environmental factors which lead to symptoms simulating those of subclinical states of vitamin deficiency will produce better and more permanent results than will be achieved psychologically by the administration of vitamin supplements to individuals who are not suffering from a nutritional deficiency.

A MEDICAL VIEW OF THE SOVIET UNION

BY

M. T. GILLIES, M.B., B.Chir.

A year's stay in Russia is small qualification for anyone to express views on the country, but the experience for a medical man is sufficiently unusual these days for a few brief and entirely superficial impressions to be worth recording. It should be added that these observations are the outcome of an Embassy appointment in Moscow and are made with a knowledge of the limitations of outlook and opportunity that such a post entails.

No remarks on Soviet standards of medicine can possibly be made without a thorough knowledge of, and free access to, their institutions and hospitals. Under existing conditions this was denied me. Hospitals could be visited in connexion with foreign patients, but such opportunities were infrequent and their scope limited. Persistent efforts were, in fact, made to visit officially one particular Russian medical man of eminence, all of which, however, were deftly parried by VOKS, the Soviet organization for promoting cultural relations with foreign countries. In view of the recent disappearance and strongly rumoured arrest of a Russian surgeon of international repute it would not have been prudent to pursue the matter or the man further.

As the home of the first system of socialized medicine, Russia has obvious interest for us while our own National Health Service is being established. There are certain differences. A fundamental one is the absence in their system of the general practitioner. The smallest unit is the polyclinic, roughly equivalent to a health centre, which has a regional or occupational basis—that is to say, its clientele belong to a certain district or to a particular class of workers. Individual private practitioners do exist, but their activities are limited by lack of access to hospital accommodation and by strict limitations on their power of certification. A recent change of policy in the organization of polyclinics is evident from the following paragraph from *Pravda* for January 6, 1949.

"By a decision of the Government, the Ministry of Public Health is now carrying out an important reform of medical services to the population. The existing polyclinics and dispensaries are being merged with the hospitals and clinics. As a result of this merger the dispensary physicians have begun to work in the hospitals as well, and for their part tens of thousands of specialists in clinical work have come to the reception rooms. This system is noticeably improving the quality of medical services to the population."

Thus it seems that the present Soviet trend is towards centralization or affiliation of all medical services to some sort of parent hospital, whereas we envisage with the setting up of health centres what will be to some extent the opposite tendency. Two other small points may be noted. Medicines and spectacles, let alone wigs, are not issued free, but the sum charged is not high. Secondly, it is significant that private practice among dentists is very flourishing and, so far as one can tell from casual acquaintances, their services are widely used. Incidentally the inauguration of the Health Service in Britain was the occasion for a violent article in *Meditsinsky Rabotnik* under the heading "A new law, a fresh burden on the shoulders of the workers of Britain." The provisions of the Bill were completely ignored and the author, a doctor, expatiated instead on the inadequacy of the medical services in England and the low standard of living of the masses—quoting freely from the correspondence columns of the *B.M.J.*

On the purely domestic side of Embassy practice specialist opinions and hospital treatment were arranged through a special diplomatic polyclinic, designed exclusively for the use of the foreign community. This was the one place where consultations could be held and opinions on medical and other matters

officially exchanged. The building was equipped with *x*-ray and physiotherapeutic plant and was lavishly furnished with carpets and brightly coloured awnings. Everybody there was always most helpful and co-operative. A quaint feature of the system was the payment of a not inconsiderable fee, cash down in advance, on entering the establishment.

Moscow itself has a fleet of fast "emergency aid" cars which can be summoned by dialling a simple number on the telephone. They carry stretchers and attendants under the charge of a doctor and provide a prompt means of admission to hospital. Smaller cars, labelled "House Aid," are often to be seen on the streets and provide treatment at home for those too ill to visit the polyclinics.

The Aptecka, or State pharmacy, is a characteristic feature of the Soviet system. These are usually rather large shops, open all night, with a big dispensary and sometimes with a department where toilet preparations and drugs requiring no prescription can be bought. Sulphonamides in small quantities can be obtained in this section, as for instance in a popular official remedy for influenza compounded of hexamine and sulphanilamide (0.3 g.). Vitamin preparations such as rose hip syrup and cod-liver oil can also be obtained. The range of drugs available is naturally very much more limited than in this country, and there are frequent shortages—for example, santonin, sulphadiazine, and nitroglycerin did not appear to be generally available, although santonin was being regularly prescribed for the large number of cases of roundworm infestation.

The normal procedure for a patient obtaining a medicine from one of these pharmacies is for him to queue up at the receiving counter where the girl in charge checks the prescription and assesses the price. He then joins the queue at the cash desk and pays the small sum required before proceeding to another counter where he either receives the medicine or is told at what time to return for it. Drugs are dispensed in small quantities and prescriptions need to be repeated frequently, but, in general, as a system of supplying physic to a large number of people cheaply and quickly it seems to work quite well. The principal shortcoming is that recorded by *Pravda* in the article already quoted. "In certain chemists' shops one cannot obtain even the simplest medicines and prescriptions in broad demand by the population, although our industry has every opportunity for satisfying the need for medicines."

Several aspects of the public health system are of interest. Dysentery and other intestinal infections are common in the summer, and the pharmacies display posters describing the part played by flies and dirt in the causation of these diseases and also methods for their control. In some parts of Moscow during the summer of 1948 there was a free house-to-house distribution of "phage" in tablet form to be taken as a prophylactic, though how frequently or systematically this was administered it is not possible to say. The Russians have, of course, made special studies of the commercial preparation of various bacteriophages, notably in connexion with the treatment of cholera and the dysenteries.

The importance of seeking prompt treatment for venereal diseases is widely advertised in Russia as in many other countries. These exhortations are reinforced by the law making it a criminal offence "wilfully" to transmit venereal disease to another person. The law also relieves casualty officers of their traditional Saturday night trials with acute alcoholics. In Moscow the police provide "*veetresveetele punkts*," or "sobering institutions," where any clients found incapable or unconscious on the streets may be accommodated for the night and perhaps afforded suitable treatment. They are discharged next morning and charged 25 roubles (a fifth of an average week's wage) for their night's lodging. This would appear to be a useful amenity in a climate where the frost could speedily dispatch anyone who was drunk and sleeping in the open.

During the course of the year the Lysenko controversy came to a head. The main battle was, naturally, fought out by the biologists, but there were minor skirmishes in the medical world. The whole issue is quite incomprehensible without some conception of the general feeling of optimistic expectation about the future which is widespread in Russia to-day and not always so apparent in England. In an article in *Meditsinsky Rabotnik* on September 15 last a writer stated, "By common effort we must cleanse the field of Soviet Medicine of all idealistic and metaphysical weeds, so that we can move forward in seven-league boots and quickly solve the problem put before us by the great Stalin—not only to overtake but to surpass in the near future the scientific achievements abroad."

A young scientific worker would perhaps feel that he must temporarily suppress his doubts and critical faculties with regard to genetics as the price for belonging to and working for what he believes to be a greater movement. In other words, the material advancement of the people of Russia, and indirectly of the world, as he believes it, is more important than scientific truth. On the popular side there is no doubt that Lysenko has been most successfully "sold" to the Russian public. I attended a cinema performance once in which a news-reel depicting several public figures was being shown. No interest was evinced by the audience until Lysenko appeared on the screen. He was immediately recognized, and his name could be heard in approving whispers all over the hall.

The emphasis on patriotism has been most marked in Soviet films recently. The central theme of *Court of Honour* was the trial of a misguided Russian scientist who gave away the results of his work to a visiting American scientist, later unmasked as a secret service agent in disguise. During the course of this film someone remarks, "These Americans! Why, they even sell us a single dose of streptomycin for the same price as it takes to build a house!" (Streptomycin is presumably available for sale to the Soviet Union at the same rate as to other European countries.)

Academician Ivan Pavlov was another recent film, giving the story of his life and work and emphasizing that he placed his country above his work and his patriotism above world science. This film contains one amusing non-political scene at Cambridge as Pavlov receives an honorary degree from the chancellor. In the middle of this impressive spectacle a little woolly toy dog descends suspended on a string amidst shouts of "Hullo" from the playful undergraduates in the gallery. The great man grabs the dog good-humouredly and continues the ceremony with it tucked tightly under his arm.

In contrast to the lack of personal contact permitted one could, as a scientific worker, have access to one or two libraries and museums, notably the big Lenin Library in Moscow. This is a fine modern building embellished on the outside with busts commemorating, for example, Newton and Darwin. Quite a wide range of Russian and foreign literature, especially German, appeared to be available and could be consulted without difficulty. But this free use of a Russian institution was notable as an exception to the general restrictions, as the scantiness of this account shows.

INSTITUTE OF DISEASES OF THE CHEST

OPENING BY SIR JOHN ANDERSON

The opening of the new premises of the Institute of Diseases of the Chest (British Postgraduate Medical Federation), in the grounds of Brompton Hospital, Fulham Road, took place on October 26. Sir John Anderson, M.P., chairman of the Governing Body of the Federation, who performed the opening ceremony, said that no observant layman could fail to be profoundly impressed by the progress made in medicine during the past half-century. Medicine, a profession which had been carried on for hundreds of years on traditional and mainly practical lines, could now claim as never before the attributes of an exact science. If the public were to have, as it was entitled to have through the National Health Service, the full benefit of all the developments of scientific medicine, a great extension of facilities for higher medical education and research was clearly essential, and that was the significance of the new Institute.

Sir John Anderson went on to remind his audience that this was one of a number of specialist institutes in process of being

established under the aegis of the Federation. There was no room for doubt about the justification for including this kind of institute in its framework. Despite what had been done during the past 35 years, there was still a need for concentrated effort in the sphere of chest diseases, and the contribution which the Institute could make to the public good would be commensurate with that need. He added that the tradition firmly rooted at Brompton would provide a most favourable atmosphere for successful work.

Sir Robert Young explained that the Institute would serve two hospitals—namely, Brompton and the London Chest Hospital, institutions very similar in their aims and objects. It would promote collaboration, and would serve to make London with its wonderful material a focal point of teaching and research in diseases of the chest. He himself joined the staff of Brompton Hospital 54 years ago, and he recalled the pioneer work of the staff in those far-off days. Since the hospital opened in 1849 many methods of treatment had been examined and tried out, and knowledge had advanced by strides. Perhaps it was in the department of surgery that he had seen the greatest change. Now the staffs of the two hospitals were doing their utmost to train young surgeons in this branch of surgery. The Institute was yet another new venture which he felt to be full of promise.

Dr. A. Roodhouse Gloyne, consulting pathologist to the London Chest Hospital, said that these two hospitals came into existence a century ago very closely together—the London Chest Hospital in 1848 and Brompton in 1849, the latter founded by Thomas Bevill Peacock, who wrote a standard textbook on congenital heart disease and also investigated a form of silicosis in workers on millstones for grinding flour. A tribute was due to other physicians in those early days who came to a right conclusion on what would now be considered very inadequate data. The hospital was also interested in cardiology, and some great men in this field had been numbered among its physicians. As a medical school the London Chest Hospital, until the end of the first world war, was a rather fortuitous institution, graduates coming and going without very much organization.

In the development of the new Institute he hoped that the humanities would not be forgotten. As the staff grew alongside each other, co-operation would improve until the Institute became a complete unit. One of the things the Institute would do would be to advance the study of industrial lung disease; he hoped the heart would not be forgotten, and that in investigating disease in the periphery of the chest the pericardium would also receive attention. The Institute would also study carcinoma of the lung, the incidence of which seemed to be advancing.

Plans for the Institute

Sir Francis Fraser, director of the British Postgraduate Medical Federation, said that the first step in an exciting venture had now been completed. For many years the large general hospitals were used for undergraduate education, but the special hospitals which offered almost unrivalled opportunities for the advancement of knowledge and for postgraduate and advanced education were hardly used at all. Committees had discussed the various possibilities, and as a result the Postgraduate Medical School was established at Hammersmith, with university departments in general medicine, surgery, obstetrics, and pathology; but it was agreed that no attempt should be made to set up university departments in the special branches at Hammersmith, and that these should be based on special hospitals. The new Institute represented a further milestone in this progress. It would be some time before the staff was completed to the extent which would fulfil the hopes and aspirations of the previous speakers, but it was already being gathered together. Under the National Health Service the London Chest Hospital was joined with the Brompton Hospital for the purposes of providing clinical material and staff, and it was with every confidence they looked forward to the development of the Institute.

The Institute will be able to provide whole-time courses for three months for 12 students and part-time courses for twice as many. When it is fully equipped—which will probably not be for some time—it is expected that there will be facilities for up to 50 students at once. The accommodation, which is all on one floor, includes laboratories, a lecture theatre, *x*-ray and photographic departments, a library and reading-room, and a refectory. It is hoped to carry out "pure" research as well as the routine research work of the associated hospitals.

Reports of Societies

CORTISONE IN RHEUMATOID ARTHRITIS

A meeting of the Section of Physical Medicine of the Royal Society of Medicine was held on October 12, when Dr. OSWALD SAVAGE discussed the effects of cortisone in rheumatoid arthritis, and gave an account of his recent visit to the Mayo Clinic.

Dr. Savage said that with some 50 other physicians from various parts of the world he was privileged to see the work on cortisone which was being done on the other side of the Atlantic. He saw two cases before and after treatment, and he had no doubt about the remarkable changes effected by this drug in rheumatoid arthritis. As was to be expected with research teams headed by Dr. Philip Hench and Dr. Kendall, the work was most carefully checked and controlled. The patients were suffering from severe active rheumatoid arthritis, and the changes which were brought about almost within a matter of hours were astonishing. One woman aged 55 had suffered from rheumatoid arthritis for three years; she could hardly walk, and was so crippled that it took her more than two hours to do her hair in the morning, yet within two and a half days of the first administration she was completely free from pain and walked normally. She declared that she felt a sudden improvement nine hours after the first injection; it was as if a load had been taken off her limbs.

The history of the work which led up to this discovery was fascinating. During the war it was rumoured that German pilots were given injections of suprarenal extract to increase their fighting morale, and there was a good deal of support for the theory that such an extract might be of value in battle fatigue. The rumour added momentum to the work already proceeding in the States, where Hench had been studying the reversibility of rheumatoid arthritis, and, turning to biochemical considerations, had concluded that what he had called the anti-rheumatic substance *x* might be the suprarenal hormone.

To understand the work on cortisone the adrenal steroids must be studied. Work on adrenalectomized animals had resulted so far in the isolation of 28 adrenal steroids, but only six of these, which could be divided into three groups, were active. The group which was oxygenated at the eleventh position and called 11-oxysteroid was the one with which this work was particularly concerned. As the work progressed a number of compounds were evolved, of which the one called compound E was by far the most active in its effect on carbohydrate metabolism. Dr. Savage also touched on the work done on the adrenocorticotropic hormone (ACTH) and its effects.

Clinical Results

Clinical improvement after the injection of cortisone might begin within four hours and was usually sudden. The patients felt as if something had been "unlocked" and lost their stiffness. Joints which had been tender on pressure were no longer painful when pressure was applied, and the swelling also disappeared, though not as quickly as the pain. They experienced a remarkable euphoria, and afterwards usually fell into a sleep of exhaustion. They acquired enormous appetites and sometimes had to be dieted to prevent obesity. The dose, given intramuscularly, was 300 mg. on the first day and 100 mg. on the second. The dosage of the adrenocorticotropic hormone was 50 mg. three times a day on the first day and 25 mg. on the second day.

The side-effects had been rather overemphasized, but it was necessary to make them known in order to help to ensure that,

when this drug became available, it was used only under the most carefully controlled conditions in hospital. Much study remained to be done on these effects, some of which were due to pituitary upset and electrolyte imbalance. Severe vomiting had followed the use of adrenocorticotropic hormone.

Unfortunately, directly cortisone was stopped the symptoms returned and the sedimentation rate again rose. In the severe cases so far treated it looked as if treatment would have to be continued indefinitely. The number of cases treated at the Mayo Clinic up to June of this year was only 17, but some of them had been under treatment and control for as long as six months. The difficulties of the production of the substance were immense; 39 long and difficult chemical steps had to be taken before even a minute yield was obtained. There had been accounts of other substances which might yield cortisone, but these related at present only to the theoretical stage. But two main points of progress were demonstrated even before the drugs were available for general use. In the first place it had been shown for the first time that the progress of rheumatoid arthritis was reversible rapidly by a drug; it had been known to be reversible in pregnancy, in jaundice, and after operations, but here was a drug which brought about the same effect. In the second place, a yardstick had been furnished with which to evaluate treatment. There had been many forms of treatment which improved the patient up to a point, but here a dramatic and rapid improvement was effected. Those who had seen the cases were impressed by the effect as compared with anything they had seen before, and thus a criterion was afforded for the treatment of rheumatoid arthritis in general.

Work in this Country

Dr. RAYMOND GREENE said that the relation of the adrenal cortex to rheumatoid arthritis had been studied by a number of workers. His own interest in the subject began some 12 years ago, and, while Hench and his colleagues reached their fortunate guess by way of a study of reversibility in pregnancy and jaundice, he approached the problem by seeking the common factor in a number of distinct conditions often associated with the onset of the disease. The hypothalamic endocrine system appeared to be a connecting link, and within this system the adrenal cortex seemed the most likely element to explore. He at first concentrated his attention on the operation of whole adrenal extracts and of desoxycorticosterone acetate, all of which were found to be ineffective. These were now being studied exhaustively in the United States.

In November, 1946, the worst case of rheumatoid arthritis he had ever seen was admitted to the Metropolitan Hospital, apparently in a moribund condition. The patient was a man aged 28 who had developed a classical rheumatoid arthritis at the end of June of that year, and the infection had spread rapidly until all the joints were involved; there was a low intermittent fever. He was treated with massive doses of acetylsalicylic acid and penicillin without effect, and a course of gold treatment was also valueless. A rash, afterwards found to be pemphigus, gradually spread over his body. His condition rapily deteriorated; and he became so emaciated that his appearance resembled that of the prisoners at Belsen. General methods for restoration were begun, and in addition an intravenous procaine drip was set up. A certain amount of improvement took place, the joints became less painful, and the pemphigus ceased to spread. Later, however, deterioration took place. By that time the speaker had obtained some corticotropic hormone, and intramuscular injections were given over a period of 18 days in March, 1947. Each dose was of only 2 or 3 mg., much less than the American dosage, and, presumably because of the smallness of the dose, the improvement was not as rapid as that obtained by the Mayo Clinic workers. The improvement was not maintained, and the procaine injections were restarted. From that time (May, 1947) improvement again took place and continued, though slowly. The skin condition was obstinate, but eventually disappeared. A urinary condition was investigated and found to be due to stones in the pelvis of the right kidney, but as there was infection in the left kidney it was decided to leave it alone, and the infection had since disappeared. The patient was discharged from hospital in December, 1947, and had remained well ever since.

This patient was demonstrated to the Section, and was able to run up to the platform. His hands were still badly deformed, but his joints were painless and he was earning his living as a weaver. He had had no treatment for nearly two years. The most likely explanation, said Dr. Raymond Greene, was that a spontaneous remission was due during 1947, but those who saw him on admission were convinced that he would not have lived to enjoy that remission had it not been for the treatment he had received. Dr. Greene also described a second case treated with anterior pituitary corticotropic hormone, with a successful result. During the last three years he had concentrated his attention on other methods of producing increased adrenocortical activity, using substances which had an inhibitory effect on histamine release, but he was not yet ready to make a statement. He said also that there was a *prima facie* case for the further investigation of the role of the spleen in rheumatic diseases; this was likely to be the organ through which cortisone and corticotropin possibly produced their effects.

Dr. MAX REISS said that Hempel and he were probably the first to use corticotropic hormone in the treatment of rheumatoid arthritis when, in 1942, experiments were carried out on a group of patients suffering from involutional melancholia. The most interesting effect was the skin change: from being dry and parchment-like, the skin felt softer and thicker; the hair regained its lustre, losing its dry, brittle quality. A considerably smaller dose was given to achieve these and other effects than was used by the American workers, and it was important to emphasize this because, assuming that the hormone could not be prepared synthetically, the American dose of 25 mg. could hardly be the treatment of the future, for all the pig pituitaries in the world would not be sufficient to treat a thousand patients regularly. The continuous use of such a high dose was likely to discourage treatment, and as the dose was higher than the quantity produced physiologically in the body it could not be called a physiological dose. The reactions were such that responsible physicians would have to consider whether they were to embark on a treatment which could produce diabetic changes, alterations in blood pressure, and so on.

In some further discussion the point was emphasized that Hench had not claimed cortisone as a cure but had reported his work only as an "investigative therapy."

INTEGRATION OF PREVENTIVE HEALTH SERVICES

A meeting of the Section of Epidemiology and State Medicine of the Royal Society of Medicine on October 21 was devoted to a discussion of the preventive health services. Dr. W. H. BRADLEY, the president, said he believed this was the first time in the history of the Section that the subject of discussion had been purely administrative.

N.H.S. in Northern Ireland

Dr. A. T. ELDER described the National Health Service arrangements in Northern Ireland, though he pointed out that what might be successful in such a relatively small community might not have the same success in a much larger population. He instanced a number of respects in which the Service had been integrated. The first was the operation of the school medical service by the Ministry of Health and Local Government instead of the Ministry of Education. The services transferred to the health authority included the ascertainment of physically handicapped children, the provision of medical inspection and treatment, and the cleanliness and disinfestation services. A consultant paediatric service was awaited. The administration of the school meals and milk service remained with the education authority. There was close liaison between medical officers of health and directors of education. The scheme had been expanding during the last two years, and so far there had been a happy and efficient service. At the

beginning of this year rheumatic fever was made a notifiable disease; this involved consultative clinics, follow-up, and aftercare. So far 103 notifications had been received.

Before 1948 the care of tuberculous persons was vested in local authorities. It was now the function of an autonomous body called the tuberculosis board. The appointment of tuberculosis specialists rested, after consultation with the board, with the hospitals authority. Deaths from tuberculosis had declined in recent years, though ascertainment figures had gone up—an indication of the efficiency of the new system. Northern Ireland had a system of intimation of cases of suspected tuberculosis; this meant no worry for the practitioner, who simply said to the patient, "You might have something wrong with your chest. Do you mind just having a check-up?" and referred him for examination. Four out of five cases intimated proved to have no tuberculosis at all, but those which were proved were far more than had been suspected before the scheme began.

Other examples of integration were the fusion of all central Government medical services in the one Health Ministry; the medical supervision of industrial health by the Ministry of Health and Local Government instead of by the Ministry of Labour; the supervision of mental health services by a special committee of the hospitals authority; and the unification of preventive medicine with general practitioner services through the general health services board.

Dr. Elder added that vaccination against smallpox was compulsory in Northern Ireland; there was no conscience clause. From 1920, when the Government of Northern Ireland was set up, to 1947 only two cases of smallpox had been notified, both of them imported, one from Canada in 1924, and the other from Scotland in 1942. The percentage vaccinated ranged in recent years from 69 to 80%. Prosecutions were occasionally instituted, and these were followed by a new spate of vaccinations. During the past 20 years there had been only one confirmed case of encephalitis following vaccination, and in that case the patient had been vaccinated with lymph which had not come from the usual source.

Midwifery Services

Dr. M. W. GEFFEN referred to the arrangements for midwifery services in England and Wales. It was the duty of the local health authority to ensure that an adequate number of midwives were practising in the area. Domiciliary and institutional midwifery could not be separated; many confinements started at home and ended in hospital, but the domiciliary midwives were under the local health authority while obstetric specialists were employed by the hospitals authority. He thought that the midwifery service of the future, if it was to be integrated, must be placed under the regional hospital boards and eventually in the hands of management committees.

One of the most interesting parts of the work of the medical officer of health was the care of the school-children within his district, but to-day specialists were appointed by the regional hospitals boards, and although the divisional medical officer did some ascertainment the case afterwards passed from his hands to county headquarters and he heard no more about it. That was not a good example of integrated health services. Much was heard also about decentralization and the utilization of the services of the district medical officer as an assistant county medical officer, but his experience was that the district medical officer was very much of an assistant and had, practically speaking, no free hand at all. There had been in this respect a levelling down rather than a levelling up.

Dr. Geffen also questioned whether it was really necessary to have set up hospital management committees throughout the country. Was there not some existing machinery whereby hospitals in small groups could have done the work without a new organization? In his view there was no reason why the public health committees of local authorities should not have been the hospital management committees. It would have been a fine piece of integration if the public health committee of the local authority could have been made responsible for a group of hospitals, with the medical officer of health as chief officer. The setting up of additional committees with additional officers, while all the time there were standing committees democratically appointed, with officers of experience ready to hand to integrate the hospitals with the environmental health services, seemed a wasteful policy.

The M.O.H. and General Practitioners

Dr. E. D. IRVINE (Dewsbury) said that the present phase was one of expansion; consolidation would come later. He disagreed with those who complained so bitterly about the division of responsibility between hospital boards and health authorities. Any integration of service depended much more upon good will than upon a tidy machine. Even the environmental health services were not administered in a tidy and simple fashion. His experience was that the greatest possible value attached to meetings between medical officers of health and general practitioners and consultants. As it was, the medical officer of health had no place on regional board committees; on hospital management committees he might or might not have a place. His membership of the local medical committee was most valuable. In his area the general practitioners had a most friendly and co-operative attitude to other branches of the Service, but he wished that local medical committees could be established in smaller areas than counties so that other medical officers of health besides those of counties and county boroughs might take a useful place on them. He believed in an all-purposes local health authority of moderate size in which social work could be linked up with environmental control.

Dr. BRADLEY, from the chair, said that he thought Dr. Irvine might take it for granted that it was the generally accepted principle of those concerned in central administration that plenty of flexibility at the periphery was desirable, and if people at the periphery looked for opportunities to employ that flexibility nobody was going to get in their way. They were now watching a great new Service developing. They did not expect it to move smoothly at once, but they did expect it to move in the right direction. He asked whether in Northern Ireland the intimations of suspected tuberculosis were compulsory and whether any provision was made for payment of the notifying practitioner.

Dr. ELDER replied that in Northern Ireland the intimation of cases of tuberculosis by practitioners was not paid for. By Act of Parliament practitioners were required to report to the authority any suspected case; there was a penalty under the Act, but it was not rigidly enforced, and indeed in practice the arrangement worked better than had been expected. Where they had expected 3,000 or 4,000 intimations they had had 10,000. In general in Northern Ireland they believed in as much devolution of responsibility as possible. A question had arisen about general practitioners acting as obstetricians in smaller hospitals. Eventually it had been agreed that certain hospitals of the cottage hospital type, set apart for normal midwifery, should continue to be served by general practitioners, subject, however, to two provisos: one, that the advice of a consultant obstetrician must be available for any complication, and the other, that the obstetrician should have the right to advise upon the competence of any general practitioner to do midwifery in these hospitals.

MANAGEMENT OF RHEUMATIC FEVER

A meeting of the Section of Medicine of the Royal Society of Medicine on October 25, Sir ADOLPHE ABRAHAMS presiding, was devoted to a symposium on the management of rheumatic fever and its early complications.

Dr. PAUL WOOD, like ensuing speakers, based his remarks on observations made at the Canadian Red Cross Memorial Hospital (Rheumatic Fever Unit) at Taplow. It was important, he said, in the management of rheumatic fever to detect the presence or absence of carditis. According to the literature the average proportion of cases in which carditis was present was 50%; in the cases at Taplow it was 72%, but these were selected cases. Eight main signs of carditis were: (1) significant mitral systolic murmur; (2) Carey Coombs sign; (3) new or transient aortic diastolic murmur; (4) cardiac enlargement; (5) pericarditis; (6) signs of heart failure; and two electro-

cardiographic signs: (7) prolongation of the P–R interval; and (8) the Q–Tc sign.

The mitral murmur was commonly long and loud. About 45% of cases with loud murmurs developed mitral stenosis as against 9% of those with soft murmurs. The Carey Coombs sign had been found in 58 of the 75 cases with myocarditis. The murmur was permanent in the majority of cases. It went on or was recurrent until mitral stenosis developed. Carey Coombs had been right in supposing it to be due to organic mitral changes. An aortic murmur was heard in 44 of the cases. In the ordinary case little evidence of cardiac enlargement was seen radiologically, though a spurious enlargement was often noted. The heart enlarged with fever at any time and became smaller as the fever disappeared. Enlargement when due to heart failure was, of course, reversible; if the patient's condition improved the heart would become quite small.

Pericarditis had been a source of great trouble. It was not known how to diagnose it with certainty. Only 25% of the cases had shown this condition. As for heart failure, they had been pleased, and perhaps surprised, to find that patients with right heart failure did not die suddenly, and thus it was permissible to make investigations, of which at first they were very chary. He did not want to stress the electrocardiographic signs too much. The prolongation of the P–R interval occurred only in about 10% of the group, but the Q–Tc sign was useful. Dr. Wood concluded with a reference to rest and exercise. Before the principle of rest was given up, it was for the people who pleaded for exercise to prove that it did no harm.

Home or Hospital

Dr. E. G. L. BYWATERS reproduced an American estimate of the relative costs of care of the rheumatic case:

Home care	$ 30–35 per month
Foster-home care	$ 45–50 per month
Convalescent home care ..	$120 per month
Hospital care	$400 per month

If the home was well-to-do and the family physician available, home care might be preferable, but in the majority of cases the patient was better in hospital, preferably with a school attached. It was desirable that only one hospital should take care of the child. The first thing was to make sure that the case was really one of acute rheumatism. In a case of early osteomyelitis of the knee or hip it was better to start treatment with large doses of penicillin, even if the case proved eventually not to be one of rheumatic fever.

Rheumatic fever was a self-limiting disease, and if the cardiac sequelae could be prevented it would be of no more importance than mumps. It was the general opinion that the heart would be damaged less if the demands made on it were cut down to basal requirements. The Taplow cases afforded no evidence in favour of early rising, but in Chicago the active life, including boating and swimming, had been advocated, the only criterion being that the E.S.R. should begin to show a definite fall. Accepting rest as the most important measure in the treatment of cardiac rheumatism, for how long should the rest continue? The speaker showed a complicated chart, including temperature, pulse, and many other records, from the study of which, he said, they might feel capable of arriving at a true judgment of the stage which the condition had reached and of the point at which the child should be allowed up. The sedimentation rate was one of the most useful criteria; at Taplow it was estimated weekly. Salicylates produced a fall in the rate, but this was capricious, and it was felt that attention should not be paid to the actual level of the sedimentation rate while the patient was being given salicylates. Weight changes, although slow, were reliable guides. Bed rest must be maintained, and then the patient should be got up gradually, a close watch being kept on all phases of his activity.

Salicylates, although they had been in use for three-quarters of a century, still provoked a great deal of argument. They were able to do little more than relieve symptoms. They depressed the sedimentation rate not only in rheumatic but in non-rheumatic subjects. He did not think they actually cured the disease.

Penicillin in Prophylaxis

Dr. J. A. PITT EVANS said that workers in America and Australia had found that small doses of sulphonamides had some prophylactic value, but sulphonamides given over a long period might have a deleterious effect. Penicillin, on the other hand, was practically devoid of toxicity. In the experiment he reported one daily dose of 100,000 units of penicillin in 5% glucose was given before breakfast. This study had been carried out from November, 1946, to September, 1948, and concerned 165 children, with a control group of 145. The details of the study will be published, but Dr. Pitt Evans said that the evidence appeared to show that penicillin was of considerable value in preventing streptococcal infections—and consequently rheumatic relapses—among children in a convalescent home.

Professor ROBERT CRUICKSHANK said that records of the previous five years had shown something like a 50% relapse rate, but in this experiment the control cases did not show the incidence one would expect. The fact was that when a prophylactic measure affecting half a community was introduced the load of infection was considerably reduced, and therefore the rate of clinical infection expected from previous records might not be attained. Nevertheless, even the statistician would be satisfied that the penicillin was of value, and he was sure it was a method of prophylaxis to be followed up.

In some further discussion Dr. T. F. COTTON said that the Government should be praised for what it had done in building up the national institution at Taplow. As for treatment, his experience led him to the conclusion that rest alone availed. Dr. JENNER HOSKIN said it had been interesting to learn of the importance of the loud systolic murmur which was often heard in elderly patients and to which not much attention was paid. The pulse rate was not entirely reliable, as it varied with the excitability of the child.

Social Factors

Dr. GERALD SLOT mentioned the change in the type of rheumatism seen to-day as compared with that seen not many years ago. In the early 'thirties and even later a common case of rheumatism seen at supervisory centres was the child with swollen joints, but this type of rheumatism did not seem to be as common as formerly. Dr. Slot also made some observations on the social class from which the majority of rheumatic children came. A social survey in West London showed a large number of patients coming, not from the poorest class, but from the lower middle classes. He had been in touch with the medical officers of some of the largest public schools, and they declared that this was not a problem which affected them at all, yet in the rheumatism supervisory centres organized by the L.C.C. there was an overflow of cases. A theory which he thought he could disprove was that rheumatism was associated with dampness. Among children living in poor houses in riverside districts in London, where there was a lot of damp, he had not found any unusual incidence of rheumatic cases, although, of course, the damp house also suggested general poverty and perhaps lack of supervision. He had also noticed that when the pains were only in the leg it was likely to be an orthopaedic problem, and when they were in both legs and arms there was more likely to be a rheumatic factor concerned. He did not find much help in the electrocardiogram; when help was most needed it was least helpful. The sedimentation rate was of value, though he thought that in their eagerness to get hold of any method of assessment they tended to rely on it rather too much. It was a non-specific test. He did not think that salicylates did any good beyond relieving pain.

The Third Congress of the International Scientific Film Association, which was recently held at Brussels, included fourteen delegates from Britain. The Royal Society of Medicine was among the bodies represented. The inaugural presentation of scientific films was attended by Her Majesty the Queen Mother of the Belgians, who later commented on the excellent quality of the British films shown. Information about the work of the Scientific Film Association of Great Britain may be obtained from its secretary at 4, Great Russell Street, London, W.C.1.

Correspondence

R.M.B.F. Christmas Appeal

SIR,—Extra comforts at Christmas time are a great help in time of need—the little extra coal, the urgently needed warm clothing, the wherewithal to provide a real Christmas dinner. I appeal to members of the medical profession to bring these comforts to their less fortunate professional brethren, or to their widows and children who are beneficiaries of the Royal Medical Benevolent Fund. Not only will gifts bring them comfort and cheer, but their hearts will be warmed by the kind thought for them.

I hope that all, whether subscribers to the fund or not, will send donations to provide this little extra cheer, and that those who are not subscribers will become regular supporters of the medical profession's own Benevolent Fund. Donations and subscriptions, marked "Christmas Gifts," should be sent to the Secretary of the Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, London, S.W.15, and will be gratefully acknowledged.—I am, etc.,

WEBB-JOHNSON,
President,
Royal Medical Benevolent Fund.

Malignant Tertian Malaria

SIR,—Your correspondent, Dr. P. Ross (October 22, p. 930), makes some sweeping statements about the clinical manifestations of malignant tertian malaria. It would appear to me that the clinical descriptions of well-known and generally accepted *accés pernicieux* of this infection are thereby impugned.

Most practitioners, I think, with an extensive experience of the vagaries of this type of malaria will agree with Sir Gordon Covell (October 8, p. 773). His statements regarding the protean manifestations exhibited by *Plasmodium falciparum* tally with my own in European soldiers exposed to mass infection under war conditions. I am certain that some exceptions have to be made in tropical natives, who may exhibit various degrees of immunity to subtertian malaria. That such immunity exists is hardly open to doubt, but numerous observers have drawn attention to the fact that they, too, may succumb to cerebral or abdominal malaria on being exposed to a foreign strain of *P. falciparum*.

It has been my misfortune to witness errors of diagnosis on more than one occasion, and to have seen laparotomy performed on what Dr. Ross terms "typical cases" of subtertian malaria. It would ill become me were I not conscious that acute appendicitis may occur during the course of malaria, or that acute cholecystitis may be a sequel to it—not that surgical intervention may be indicated in these cases—whether malaria parasites are present in the blood or not. But to advise young practitioners going out to the Tropics to ignore the teaching of textbooks which are based upon long and hard-won experience of subtertian malaria in many lands and under many diverse conditions would be a betrayal of the truth. I would remind your correspondent that the chapter on malaria in *Manson's Tropical Diseases* was not composed in a day or even after a flitting wartime experience.—I am, etc.,

London, W.1. PHILIP MANSON-BAHR.

Infant Vaccination

SIR,—Dr. C. Killick Millard (October 22, p. 929) takes me to task for "begging the question" of infant vaccination in the concluding paragraph of an article I contributed to the *Monthly Bulletin of the Ministry of Health* (1949, **8**, 204). Dr. Millard's dislike of infant vaccination is well known. Unfortunately the evidence on which his views are based, and also those of many who disagree with him, is frequently distorted by less critical persons who seek to discredit not only infant vaccination but all vaccination against smallpox and, incidentally, immunization against diphtheria as well. This accounts, I think, for much of the reticence which at first sight might appear to be "question begging" in the references to this subject in official and other publications.

In the article in question I did not attempt to discuss the pros and cons of infant vaccination, and most certainly did not intend to minimize its difficulties and dangers, of which I am well aware, as may be seen from an article on post-vaccinal encephalomyelitis to be found in an earlier number (1948, 7. 72) of the same journal.

During the last 18 months I have been able to meet doctors concerned with the control of smallpox in Holland, France, and other European countries as well as in the United States and Canada. All of them I found to be aiming, though with varying success, at a well-vaccinated child population as an important part of their own national defences against smallpox. I was therefore concerned in my recent article to set out in some detail the current position of infant vaccination in this country and to point out that by our apparent neglect of this procedure we were giving the impression abroad that we were not regarding protection against smallpox as a serious matter at the present time. I submit that the paragraph quoted from my article can and should be read in that sense.—I am, etc.,

E. T. CONYBEARE.

Post-operative Thrombosis

SIR,—In these days when there is a more widespread awareness of venous thrombosis many clinicians, feeling that the early signs of calf thrombosis are sometimes slight and equivocal, are anxious to find some simple laboratory test which will give them courage in diagnosis and guidance in treatment. I was greatly interested by Mr. G. W. Vause Greig's article (October 15, p. 845), because I feel sure that the paper of Cummine and Lyons[1] to which he refers has given rise to unjustifiable hopes of a simple diagnostic test for thrombosis.

While there is commonly a fall in the coagulation time during or immediately after operation, most investigators have found that at a later stage there are rarely any significant changes. This observation is valid whatever method is used for estimation of the clotting time. I recorded clotting times daily in the majority of cases in two general surgical wards for a period of three months in 1948, and I have never found this investigation of the slightest help in diagnosing post-operative thrombosis. In the several cases of undoubted thrombosis which occurred during this period the coagulation graph did not show any significant change. In the present state of our knowledge it would seem that it is only by careful observation of the temperature chart and meticulous examination of the patient's legs that an early diagnosis of thrombosis can be made; it is perhaps remarkable that this essential practice is not even mentioned in Cummine and Lyons's paper.

Our experience with the fibrinogen-B test has been similar to that of Mr. Vause Greig, but positive results were obtained in a smaller proportion of cases. The finding of fibrinogen-B has borne no consistent relationship to the occurrence of thrombosis, and it has also been noted that not all samples of β-naphthol are suitable for this test. My colleague, Dr. W. G. Dangerfield, has prepared his solution by the method of Lyons and has commonly found that it does not turn brown on exposure to oxygen. Under these circumstances gel formation does not occur. We cannot satisfactorily explain these results, although it may be that some preservative in the β-naphthol accounted for the failure of the test in many of our cases, since it was more often positive when older solutions were used.

The fibrinogen-B test, like the coagulation graph, is in my experience of no help to the clinician. There is as yet no test which will surely tell us which cases of thrombosis will advance and which will be spontaneously arrested. No test will relieve the clinician of the responsibility for careful daily observation of his patients, and in this he can be greatly assisted by residents, nurses, and physiotherapists who are constantly alert for the early signs of thrombosis.

It would be most interesting to hear from others who have attempted to confirm Cummine and Lyons's original work.—I am, etc.,

Radlett, Herts. R. S. MURLEY.

REFERENCE

1 *Brit. J. Surg.*, 1948, **35**, 337.

SIR,—In his article on post-operative thrombosis Mr. G. W. Vause Greig (October 15, p. 845) suggests that a positive fibrinogen-B test in the post-operative period does not always predict that thrombosis will occur. Soon after operation I think this is true, and appreciation of this fact may prevent the indiscriminate prescribing of anticoagulant therapy based on a laboratory finding only.

In assessing whether a patient is a candidate for thrombosis one should always take into consideration age, previous history, and the results of careful clinical observation and examination. The use of anticoagulants in the post-operative period should not be undertaken lightly. When they are used too early there is the danger of severe wound haematomata. When used prophylactically they should not be administered before the third day following operation and the danger of wound haematomata should always be borne in mind.

Fibrinogen-B depends on the modification of fibrinogen by recently circulating thrombin in the blood stream. During and for some time after a surgical operation there must be some thromboplastin, liberated from tissue damage, which reacts with the prothrombin and calcium of the blood to produce thrombin. Therefore it is not surprising that following a surgical operation the plasma of the patient often gives a positive fibrinogen-B test. Since only a very small proportion of the patients develop a post-operative thrombosis, a positive fibrinogen-B test alone, soon after operation, is not sufficient evidence on which to predict whether a patient will develop a thrombosis.

Mr. Greig appears to have used the fibrinogen-B test described by Cummine and Lyons.[1] I had the pleasure of discussing with Dr. Lyons at Oxford last year the difficulties we were encountering with this test. He agreed with me that the original test did require some modifications. Since that time I have used with some slight modifications the test which he outlined as follows:

Nine parts of blood are mixed with one part of sodium oxalate solution (1.34%) and centrifugalized at about 3,500 r.p.m. for 10 minutes. The plasma is then removed and 0.5-ml. portions pipetted into each of three small tubes of 8 mm. internal diameter. To one tube seven drops, to the second six drops, and to the third five drops of the β-naphthol reagent are added from a Pasteur pipette. The tubes are gently shaken and allowed to stand at room temperature for 10 minutes, after which they are tilted and examined for gel formation. A positive result shows definite gel formation in one or more of the tubes. In the case of negative results the contents of the tubes are milky, but there is no sign of gel. If the tubes are centrifuged for one minute at about 2,500 r.p.m. and then reshaken the positive tubes show a definite coagulum, whereas the negative tubes show none or practically none, when tilted horizontally and viewed from above.

With regard to the value of the capillary-tube method for estimating whole blood coagulation time, it is now accepted as the least accurate of such methods.[2] Mr. Greig does not state at what temperature the clotting times were estimated. The variations in the temperature of the operating theatre and the wards at different times of the day could account for great variations in clotting time. There are of course other variables which affect this crude test. I therefore doubt whether the suggestion that "thrombosis, if it does occur, probably starts during or immediately after operation" can be confirmed by means of this test.—I am, etc.,

Manchester. H. LEMPERT.

REFERENCES

1 *Brit. J. Surg.*, 1948, **35**, 337.
2 Biggs and Macmillan, *J. clin. Path.*, 1948, **1**, 269.

SIR,—Although I am aware of the many difficulties inherent in conducting an investigation of intravascular thrombosis I feel that certain statements in Mr. G. W. Vause Greig's paper (October 15, p. 845) should not pass unchallenged. With regard to the method, Cummine and Lyons[1] estimated the coagulation time daily, and twice daily if there was pyrexia, and they stress the considerable group variation that may occur from day to day, and, contrasting it with the less common individual variation, they emphasize that it is only the persistently low or persistently falling clotting time that is of prognostic import.

When I had the opportunity a few months ago of discussing these tests with Lyons he again emphasized the importance of demonstrating this persistence, and pointed out that in his paper it was recommended that when the clotting time is below four minutes estimations should be made hourly during the following two hours; only if during these three consecutive hourly readings the clotting time remains persistently low should heparin be given.

Mr. Greig divides his results into four groups as suggested by Cummine and Lyons, but he is wrong in attributing to these authors the statement that it is only in Group 4 that there is danger of thrombosis. On the contrary, it is only Group 1 that is free from the danger. Patients in Group 2 are liable to thrombosis if they suffer from venous stasis or have had a previous thrombosis which can serve as a nucleus for further spread. Those in Group 3 have free thrombin in the circulation, and this has been seen as a primary phenomenon only after operation or parturition in the early stages before fibrinogen-B has had time to develop. It occurs usually as a secondary phenomenon following thrombosis and may then herald disaster, especially if the primary thrombosis has occurred in the pulmonary circulation. Patients in Groups 2 and 3 therefore require very careful observation both clinically and by laboratory investigation if thrombosis is to be prevented or diagnosed at its inception.

The one case in Mr. Greig's series which developed thrombosis would appear, in the absence of amplifying detail, to support the theory of Cummine and Lyons. The sequence of events shown on the chart suggests to me that this patient had, during her whole post-operative course, a tendency to thrombosis, that she, in fact, had a minimal thrombosis on the sixth day, and that the fall in clotting time which began on the tenth day was a warning signal to test again for fibrinogen-B. Whatever interpretation be placed on the events in this case it is clear that factors other than the clotting time in the presence of fibrinogen-B must be taken into account when considering, for example, intravascular thrombosis, venous stasis, tenderness in the calf, or pain on forced dorsiflexion of the foot.

One would have liked to see stated in Mr. Greig's paper the criteria on which he would base a diagnosis of thrombosis. His confirmation of the fall in clotting time occurring in most patients during and immediately after operation is in accord with the theory that the accelerated rate of clotting is due to circulating thrombin—an event which might reasonably be expected to occur following the trauma of operation.

There is, I think, general agreement nowadays that venous stasis and pressure on the calf veins during operation in association with circulatory thrombosis do cause minimal thrombosis in the small veins of the calf and that subsequent massive thrombosis is an extension of the process, and it behoves us therefore to seek carefully for this extension with all the means at our disposal. While I am sure that Mr. Greig's observations are correct, I think that they do not go far enough and afford no justification for his conclusions, and for the reasons given I would deprecate their acceptance at the present time when post-operative thrombosis is still a major factor in otherwise successful surgery.—I am, etc.,

London, E.1. R. D. POPHAM.

REFERENCE

1 *Brit. J. Surg.*, 1948, **35**, 337.

Toxoplasmosis

SIR,—The report by Mr. A. B. Nutt and others of the second case of toxoplasmosis in England (October 22, p. 905) prompts me to record the probable diagnosis of a third. I have not previously reported this case, since there was no confirmation by serum tests or histology. Most clinicians are now aware of the possibility of toxoplasmosis in considering the diagnosis of infantile encephalopathies. A tentative diagnosis has indeed

become rather fashionable, but the paucity of case reports suggests that the disease is rare. Serum tests, however, seem often to give inconclusive results, and prolonged search may be required to show the parasite in sections of fatal cases. It is probably as well, therefore, to put on record cases in which there is a high probability of a correct clinical diagnosis, even in the absence of biological confirmation.

The diagnosis in the case now reported rests upon the development in an infant of intermittent jaundice with steatorrhoea and acholic stools, enlargement of liver and spleen, progressive mental defect with blindness due to choroido-retinopathy, possibly deafness, and extreme hypotonia. No cerebral calcification was detected and there was no gross hydrocephalus. Dysplasia of the skull bones was a feature, but no pathological abnormality was detected in cartilage bone. The infant died of bronchopneumonia. There was rhesus incompatibility with the mother's blood, but no kernicterus or other evidence of erythroblastosis. Syphilis, pancreatic and parathyroid disease, and the storage diseases were excluded so far as possible. The parents were unrelated.

The child, the third in the family, was a girl born in March, 1947. She was first seen at the age of 3 months. Birth weight was 3.3 kg. Delivery was spontaneous after a slow labour with uterine inertia. It is not certain whether normal meconium was passed. At the eighth or ninth day jaundice developed, with pale stools: the jaundice disappeared after some days, but the stools remained very pale and only showed an approach to normal colour towards the end of her life. Jaundice reappeared at intervals and was present at the first examination in June, 1947, when she appeared as a small but vigorous infant, with widely open skull sutures and open, large conjointed fontanelles. The skull circumference was 15 in. (38 cm.). The liver was moderately enlarged. She was admitted to hospital for study, and was found to have a severe steatorrhoea with normal lipase activity; trypsin was demonstrated by duodenal aspiration, which also showed some bile pigment. Radiographs of the skull showed no distinctive lesion and were later scrutinized for cerebral calcification without result. No diagnosis was made. She left hospital and was seen in September, aged 6 months. There was now obvious regression in activity: she could not raise her head, would grasp, but not reach out. The liver seemed larger. Bright blood had been seen in the stools on several occasions. Head circumference was 16 in. (40.5 cm.). She was examined again in November and now failed to follow a light: the pupils gave normal reactions and there was no opacity in the media. A diffuse retinopathy was present, with much pigment gathered around atrophic patches. She gave no reaction to loud noises. The sutures and fontanelles were still widely open.

In February, 1948, she was reported nearly to have died during an attack of pneumonia. She was examined again in March, now aged 11 months, when the only new facts noted were a palpable spleen and the development of an extreme hypotonia. She died at home shortly afterwards. An autopsy revealed no light on the diagnosis. There was no gross hydrocephalus: the liver was large (555 g.) and pale, the thymus large, and the suprarenals very small. Sections showed no evidence of storage disease nor of fibrocystic pancreas.

The possibility of toxoplasmosis was not considered in this case until Jacobi and Segorin's report appeared (*Lancet*, 1948, 2, 926). Professor Beattie kindly examined the mother's serum in February, 1949, with negative result, and on his advice further specimens were sent to Dr. Sven Gard at Stockholm. A positive test was found to a titre of 1:10 with freeze-dried serum, but a second examination with untreated serum gave no result. Sections from many organs were retrospectively examined for parasites without any being identified.—I am, etc.,

Farnborough, Kent. DUNCAN LEYS.

Operative Treatment of Varicose Veins

SIR,—Mr. J. B. Oldham (September 10, p. 597) quotes me as carrying out the retrograde injection of varicose veins at the operation of ligature of the saphena magna. I wish to confirm this and also state my present evaluation of this practice.

I have just finished a three-year period, October, 1946, to September, 1949, during which most of the gross varicose veins under my care have been treated by the procedure of ligature at the groin or popliteal space and ankle, then internal mechanical abrasion of the saphena trunk, alternated by the fractional insertion of P25G solution (phenol crystals 2½%, glucose 25%, glycerin 25%, gelatin 0.25%); 1–2 ml. are inserted at a time, 7 ml. being injected at the groin through the long needle, starting at the knee and withdrawing, and 5 ml. are similarly inserted at the ankle from the knee downwards. I am much indebted to Mr. Riddoch, of Birmingham, for demonstrating to me the internal abrasion and telling me of his phenol (2%) and glycerin (30%) sclerosing fluid.

I have seen most patients since their operation at increasing intervals of one to six months, when visible and palpable varices have been injected as necessary with P25G solution. I am now examining them one to three years after this treatment. The results are excellent, and I am enthusiastic about the method. It is a compromise between effectively destroying the superficial varicose condition on the one hand and the danger of deep thrombophlebitis and a propagatory clot with embolism on the other.

During these three years my assistants and I have dealt with over a thousand patients. There have been no fatalities, and so far as I am aware only two instances of mild deep thrombophlebitis (both completely recovered) and one of pulmonary embolus. The latter is approximately the expectation of embolism after any surgical operation. I have made a point of inspecting all old patients. This method is effective and safe. Elsewhere I shall record an experimental variation which proved not to be safe nor so simple, and which demonstrated by contrast the effectiveness and innocuousness of the above technique.

With regard to chronic ulcers of the leg, may I say that no matter what the cause, and they are numerous, the treatment is almost the same. A bandage (not "elastoplast"; "lestreflex," or diachylon are less irritant and as effective) applied after the principles and practice laid down by Dr. Baynton in 1797 and by Mr. Dickson Wright from 1929 onwards by a trained and careful medical man will achieve what patients consistently describe as a "miracle of healing." Ointments, "sulpha" drugs, and penicillin creams, generally used and often ineffective, can be finally abandoned.—I am, etc.,

London, W.1. HAROLD DODD.

Modern Trends in Radiology

SIR,—It is now time for someone to write in support of Dr. James F. Brailsford and his views (October 1, p. 724), for he is not wholly wrong; indeed, he may well be largely right. As a specialist who tries to place his specialty in perspective and to prevent its abuse he deserves commendation and not castigation. His reward, however, is denunciation; and the tone of some letters in your issues of October 15 and October 22 suggests that their authors would feel much more at ease if Dr. Brailsford's views were suppressed. If so, then these views merit increased attention.

It seems futile to deny or ignore the truth of one main contention—namely, that radiography is being used extravagantly. For years a progressive increase in requests for *x*-ray examination has been apparent; truly the period of idolization is well under way. It would be reassuring to believe that all such requests were based on sound clinical judgment and showed no taint of desire to drop the substance for the shadow. The evidence is to the contrary. Some doctors, moreover, nursing their *bête noire* of the insidious or atypical case and determined not to be caught out thereby, make requests for *x*-ray examination on the flimsiest pretexts, and while this determination is unquestionably laudable it would be more convincing if it showed a wider range and more discriminate selection of special examinations—e.g., the less convenient and less glamorous bacteriological examination of human excreta which may be even more important. Again, the unenlightened demands of patients themselves play some part; groundless fears can often be allayed in this way, so a radiograph is prescribed with or without medicinal adjuncts but certainly with more therapeutic effect.

The growing subservience to an instrument which has received medical acclaim, Government approval, and legal recognition is shown by the numbers and variety of cases now sent for *x*-ray examination in which radiography is unlikely to be of any value and therefore wasted. Many patients with clinically average and recognizable conditions,

such as bronchitis, mitral stenosis, congenital hydrocephalus, are sent for plain radiography "just in case." In case of what? Is there, then, no pattern of disease? The same attitude is manifest in cases with definite lung disease: the repeated routine radiography of firmly calcified lesions, of inert fibrosis, of established bronchiectasis; the anxious scanning of the shadow of a tuberculous lesion for activity in an effort to read what may not be written. Why this monotonous and melancholy admission of the mastery of matter over mind? Obviously the complete diagnosis is expected. Precise analogy is difficult, but there is some similarity in this to the diagnosis of a weighing-machine, which, by showing a person's weight on one side of a card, demonstrates thereby its competence to reveal his character on the other.

The proper function of radiography is to serve medicine and not to usurp its place. Nevertheless it is a powerful instrument, worthy of a high place. It is, however, unusually open to abuse, from which it must have protection. It will not be protected by passive silence, nor by adopting the oblique suggestion made to you, Sir, that Dr. Brailsford might be "muzzled" by denying him "space in a scientific journal." I hope you will be able to give him as much space as he needs. —I am, etc.,

Glasgow. J. S. GEMMILL.

Tuberculosis: Certain Unexplained Mortality Figures

SIR,—I should be very much obliged if you would permit me to reply briefly to Dr. Ian Sutherland's letter (October 15, p. 869) in order to correct certain misconceptions and inaccuracies. Dr. Sutherland's views on the mortality due to respiratory tuberculosis in Scotland and England and Wales are, as far as they refer to my letter (September 24, p. 706), utterly beside the point. I was not concerned, as he erroneously assumes, with deciding whether the mortality due to respiratory tuberculosis in Scotland in young adults was or was not worse than it is in England and Wales. Nor was Mr. Walter Elliot's address (August 6, p. 297) concerned with this question, for the simple reason that the north-south gradient of mortality due to tuberculosis is a long-established fact. Mr. Elliot's problem, and mine, was the deterioration of the *crude* death rate in Scotland since 1939, for which I have suggested the ageing of the population as a possible cause, operating, maybe, in conjunction with other causes.

I have not, as Dr. Sutherland inaccurately states, claimed to explain most of the changes in the death rate for tuberculosis since 1939. On the contrary, I have emphasized that the statistical explanation for the deterioration of the crude death rate did by no means exclude a concomitant rise in the age-specific death rate of young persons.

The third inaccuracy in Dr. Sutherland's letter is the statement that I had failed to make a full examination of the mortality at specific age groups, and this misstatement seems to recoil upon the critic himself. For not only has he overlooked my table in which mortality due to respiratory tuberculosis for males and females in the relevant four age groups is given from 1939 to 1946, and from which certain conclusions were drawn, but he has failed himself to look at his own figures according to which the mortality of males in Scotland per thousand living has changed (by age groups) as follows:

	15–24	25–34	35–44	45–54
1939–41 ..	80	105	105	115
1945–7 ..	82	104	100	113

The rate has thus dropped in three age groups and not risen significantly in the fourth. All this is contrary to his conclusions and confirms mine.

Apart from this, it is even misleading to declare that "these mortality rates are unaffected by changes in the age distribution of the population." Since each of the age groups comprises 10 years of age, these rates are really crude death rates for each of the four decades in question. Comparisons on the basis of such rates between different countries or different periods are therefore valid only under the assumption that the two age distributions within the 10-year age groups are identical. It goes without saying that such an assumption is not always justified, and the greater the difference between the overall age distributions of the two countries or in the two periods the less justifiable becomes the assumption. This must be kept in mind when considering the rise in the death rate for older people, males (55 and up), in Scotland.

The comparison with England and Wales in my own letter was not intended to show, as Dr. Sutherland seems to imply, that there was no difference in the mortality due to tuberculosis in the two countries, England and Wales and Scotland, but, on the contrary, to explain why the movement of the death rates in the two countries was different. As regards his conclusions about the female age group between 15–34, he has overlooked that I have already drawn attention to the fact that for this female age group we must assume a physical cause responsible for the deterioration in the death rate and that the statistical explanation was not to be adopted there.—I am, etc.,

Bristol. G. HERDAN.

Chloramphenicol in Typhoid Fever

SIR,—I was very interested in the article by Dr. J. C. Patel and his colleagues on chloramphenicol in typhoid fever (October 22, p. 908). It appears to me that there may be some significance—from a therapeutic point of view—in the fact that of six typhoid cases treated three died—all within 48 hours of treatment being commenced (at 48 hours, 26 hours, and 40 hours). It appears that the mode of death in the 48-hour case was circulatory failure; the authors write, "Whether this was due to the drug or the disease is difficult to say." As regards the 40-hour case, there was hyperpyrexia and circulatory failure, and the authors say that "it could well have been hyperpyrexial reaction during the course of the disease, or it may have been due to rapid lysis of a large number of organisms."

I take it that a hyperpyrexial reaction in the course of the disease is likely in itself to be due to an additional release of endotoxin from lysis of organisms, and if this is so the problem is whether the body unaided would have induced the lysis at that particular time anyhow or whether it is more likely to have been a genuine combined operation of body plus drug. In the 26-hour case the authors say, "Probably chloramphenicol did not get a chance to act." Is it quite certain that this is so? According to the pamphlet issued with the drug, maximum blood levels can apparently be quickly achieved, at any rate in normal health, and, given adequate absorption, I think it unproved that 26 hours is too short a time in which to achieve appreciable action. I think it is therefore not impossible that chloramphenicol given in maximum dosage to a hypertoxic patient may be capable, by causing a sudden additional release of endotoxin, of precipitating a grave situation. Dr. F. Murgatroyd, in a description of a case of typhoid fever treated with chloramphenicol (May 14, p. 851), says, "In the first 24 hours the patient's general condition became markedly worse, and this gradually improved." It is true that two recent cases of paratyphoid fever successfully treated with chloramphenicol at this hospital did not demonstrate a clinically perceptible initial deterioration, but they were of favourable age groups (4½ years and 19 years) and though poorly were not hypertoxic.

If there is a danger of this effect it would be nothing new in medicine. It is true that in our use of sulphonamides and penicillin bold tactics in early dosage are advised and are both safe and rewarding. It does not follow, however, that in severe cases the first grand onslaught of the drug may not increase discomfort from toxaemia, though not to a dangerous degree. I have, however, no proof that this does occur in the treatment of coccal and bacillary infections with these drugs.

The matter is otherwise in antisyphilitic therapy, where in certain types of tertiary lesions it is well known that a dangerous Jarisch-Herxheimer reaction can be set in motion by unduly comprehensive early therapy. The danger here is not from toxaemia but from a too extensive clash of drug and organism. The parallel is perhaps closer in malaria, where "the sudden destruction of such a large number of parasites as is effected by intravenous quinine may liberate a dangerous or even fatal amount of toxin into the blood stream" (Lipscomb, F. E., in Conybeare's *Textbook of Medicine*, 1945, p. 179).

Finally, in the treatment of human brucellosis due to *Br. melitensis* in Mexico with "aureomycin," Spink and his

colleagues (*J. Amer. med. Ass.*, 1948, **138**, 145) speak of a sharp reactive rise of temperature on beginning treatment and mention the occurrence in some cases of an alarming temporary fall of blood pressure. They recommend a smaller initial dose of aureomycin (in the first two days) to overcome this effect. Possibly in the treatment of the more severe cases of typhoid fever with chloramphenicol a similar strategy might be the safer course.—I am, etc.,

Coventry. J. F. GALPINE.

The Acute Throat

SIR,—It is good to find more space in the *Journal* being devoted to subjects of particular interest to general practitioners, and I am sure most of us will have derived benefit from Dr. T. Anderson's article on "The Acute Throat" (October 15, p. 860). Nevertheless I feel that one statement made by Dr. Anderson should not go unchallenged. Of sulphonamides he writes, "The efficacy of these drugs has never been convincingly demonstrated in such conditions. Since they are undoubtedly toxic materials, carrying appreciable risks of sensitization, their administration is inadvisable, and in certain conditions may even be dangerous."

Probably everyone will agree with Dr. Anderson that the complaint of sore throat is one of the commonest made to the doctor, and further that outbreaks of acute tonsillitis are most frequently streptococcal in origin. I was taught, and my very limited experience has confirmed, that sulphonamides are of very great benefit in streptococcal infections. It is hard, therefore, to understand Dr. Anderson's first sentence in the paragraph quoted above. Surely the effect of sulphonamides in streptococcal infections is not doubted.

The alternative is penicillin. I agree that local therapy with lozenges is completely inadequate, and therefore intramuscular injections are necessary. Their efficacy is not doubted, but to suggest to a busy G.P. that he administer four-hourly injections of penicillin to all but the mild throat infections (for which aspirin, etc., are effective) is to suggest the impossible. He would not get through his day's work in 24 hours. Alternatively, to suggest that he give two or three injections of procaine penicillin for the first day and then carry on injections for seven days also demands very considerable time, and is in my opinion unnecessary in the great majority of cases if sulphonamides are used.

Further, while the difficulty of examining the writhing youngster is dealt with, no mention is made of the writhing youngster waiting for his second or third injection. The G.P. is wise to heed the comfort of his patients, particularly children. Most of them will take crushed tablets, but in any case there are now available elegant raspberry-flavoured preparations of sulphonamides which are quite palatable. But not many submit to repeated injections of penicillin without a struggle, and some put up a resistance that professional fighters might envy.

I feel it would be better to reserve penicillin for those cases due to organisms which are penicillin-sensitive but which sulphonamides do not affect, and also to use it in conjunction with sulphonamides for the very severe streptococcal cases. To sum up, I should say that, while sulphonamides are undoubtedly toxic and certainly carry some risk of sensitization, and while in some conditions they may even prove dangerous if used injudiciously, nevertheless, and bearing these facts in mind, they are by far the most useful drugs at our disposal for dealing with these conditions in general practice.—I am, etc.,

Harrogate. D. C. WILLIAMS.

SIR,—In the article by Dr. Thomas Anderson on the acute throat (October 15, p. 860) the use of bismuth in the treatment of acute non-specific infections of the throat and upper respiratory tract is not mentioned. I feel this method of treatment merits wider recognition than it has received in this country.

The original paper on its use by Monteiro, of Rio de Janeiro (*Ann. Oto-laryng.*, 1934, **4**, 557), was followed by 46 papers in South America in seven years which corroborated his original work and verified his conclusion that bismuth therapy was specific in effecting recovery in the majority of these infections in 48 hours. The need for intramuscular injection appears to have been the main objection to its use in the treatment of these infections, but with the introduction by J. S. Stovin in 1944 of the rectally absorbed compound bismuth heptadiene-carboxylic acid this disadvantage disappears.

Following the reports of successful results in many papers, a trial was undertaken in 1947 in the Queen Elizabeth Hospital in Birmingham, but as the salt used by Stovin was not available my colleague, Professor K. D. Wilkinson, suggested the use of bismuth et sodii tartras (*B.P. Add. 1*), 1 gr. (65 mg.) of the salt in 15 gr. (1 g.) of cocoa butter used as a rectal suppository. This was described by us in articles published in the *Birmingham Medical Review* (1947, **15**, 170).

Our conclusions at that time were favourable, and experience during the past two years has supported this view. In my department in the Queen Elizabeth Hospital some 65 cases have now been treated by this method. They fall into two groups. The first were cases of continued pyrexia following tonsillectomy and other surgical procedures, and in these we found in four out of five cases the temperature became normal within 24 hours of the use of the bismuth suppository. The second, a smaller group, were members of the staff of the hospital suffering from acute tonsillitis, and although failures have occurred successful cases have been in the majority. The high proportion of successful results in this small series of cases suggests that bismuth therapy should be the primary treatment in acute tonsillitis, and encourages us to hope that with its use both the period of disability and the incidence of complications will be much reduced.—I am, etc.,

Birmingham. W. STIRK ADAMS.

SIR,—I have been disappointed with the first of your refresher courses in one respect—that of treatment. The author's treatment is the old-fashioned one of gargling, inhalations, and aspirin. Penicillin is discouraged and sulphonamides contra-indicated.

May I state that my experience is opposed to this? With sulphonamides patients feel much better in 24 hours, with no temperature and little pain or discomfort. Children especially respond well, and complications such as otitis are avoided. May I ask what controlled experiments have thrown doubt on the efficacy of sulphonamides?—I am, etc.,

Birkenhead. A. V. RUSSELL.

Teaching of Physiology

SIR,—The question raised in Professor D. H. Smyth's letter (October 8, p. 813) regarding restrictions on the use of animals—in particular, dogs and cats—in the teaching of physiology in this country is, I feel, an interesting one, for no one seems to have stated clearly what these undesirable restrictions are. I can assume that no leading physiologist in this country would advocate entirely unrestricted vivisection for all and sundry. Let us then examine the restrictions as they exist to-day in the terms of the Cruelty to Animals Act (1876). I find that they are six in number, and in all but two the provisions can be avoided by obtaining the necessary certificates to prove that such restrictions would frustrate the experiment or the advancement of science.

The two exceptions are those which (1) forbid experiments for the attainment of surgical skill, and (2) forbid exhibitions in public. I suppose there is no responsible person who would wish to remove the second of these. The first does not concern the physiologist, and therefore need not concern us at the moment, but, in passing, I would say that I have never heard it stated that British surgeons are any whit inferior to surgeons of other countries on this account.

Now the certificates which are granted by the Home Office (supplementary to the licences) must be signed in the first place by one or more responsible persons, including the presidents of the Royal Colleges, medical or veterinary. They permit the following procedures: (1) experiments on animals in illustration of lectures before students; (2) experiments not directly for the advancement of physiological knowledge, and repetitive experiments to test former discoveries; (3) experiments dispensing with anaesthetics if they would interfere with the success

or object of the experiment; (4) recovery of the animal from the anaesthetic and observation for prolonged periods if killing the animal would frustrate the object of the experiment; (5) the use of cats, dogs, horses, asses, or mules if the particular animal can be shown to be necessary to the success of the experiment. In each case, it should be clearly understood, the certificate must state that the particular dispensation required is necessary; thereafter the granting of the certificate by the Home Office follows as a matter of course—at any rate I have never heard of an instance in all the 73 years of the Act in which it has been refused. Is it suggested that the eminent signatories refuse to countenance scientific investigation of value, or that types of experiment not deemed necessary to such investigation should still be performed at the whim of the research worker? May we be informed to which restrictions under the Act objection is taken?

There is, indeed, a "pain clause" which should be mentioned. It is attached to all certificates and is sometimes claimed to be a "restriction." It says that any animal in *severe* or *prolonged* pain must be painlessly killed even if the main result of the experiment has not been achieved; but even after this point the animal may still be in moderate pain which the experimenter thinks will not endure without his being required to kill it. Since, however, there is no standard, nor can be any, of what constitutes severe pain or prolonged pain, it is difficult to see that the experimenter need be hindered in his work. At any rate I should be glad to hear of any instance in which it has been put into effect. Is it felt that this "condition" restricts the teaching of physiology?

An answer to these questions would, it seems to me, clarify the issue.—I am, etc.,

Camberley, Surrey. M. BEDDOW BAYLY.

A Long Gestation

SIR,—As there has been a great deal of discussion recently of the length of the human gestation period, I thought you and your readers might be interested in the appended extract from the Saga of the Volsungs, describing a six-year gestation period terminated by caesarean section. The Saga of the Volsungs in written form dates from about the twelfth century, but was probably handed down for many centuries orally.

"So, as the tale tells, the queen soon knew that she was big with child, but a long time wore or ever she might give birth to the child: so it befell that the king must needs go to the wars, after the custom of kings, that he may keep his own land in peace: and in this journey it came to pass that Rerir fell sick and got his death, being minded to go home to Odin, a thing much desired of many folk in those days. Now no otherwise it goes with the queen's sickness than heretofore, nor may she be lighter of her child, and six winters wore away with the sickness still heavy on her; so that at the last she feels that she may not live long; wherefore now she bade cut the child from out of her; and it was done even as she bade; a man-child was it, and great of growth from his birth, as might well be; and they say that the youngling kissed his mother or ever she died; but to him is a name given, and he is called Volsung." (William Morris's translation.)

I know little or nothing of anthropology, but it has always seemed to me that the story of the six-year gestation period may have arisen from a custom, mentioned in the Old Testament, of heirs being produced for a man who died without issue by impregnation of the widow by the dead man's brother or other near relative; and that in the case of Volsung the widow of Rerir did not become pregnant for six years after his death.—I am, etc.,

Cremorne, New South Wales. MADELINE N. GORS.

Congenital Pyloric Stenosis

SIR,—The following report of three cases of congenital hypertrophic pyloric stenosis in one family may be of interest in view of Dr. J. L. Adlington's report (October 1, p. 740). The incidence in three brothers is rare. The children here described were the first, second, and third children; the fourth—a girl—was completely unaffected.

Case 1.—The first child, weighing 7 lb. 5 oz. (3.32 kg.) at birth, was admitted to the Royal Aberdeen Hospital for Sick Children on February 24, 1939, at the age of 5 weeks, with a history of vomiting after most feeds since 3 weeks old. The feeding had been changed from breast milk to lactic-acid milk, then to Nestlé's, and then to cow's milk, with some improvement in the condition for a few days after each change. The child was always hungry for feeds and had been constipated for eight days prior to admission. Peristalsis was noted, and soon after feeds projectile vomiting occurred. A pyloric tumour was palpable in the epigastrium to the right of the mid-line. Rammstedt's operation confirmed the diagnosis, but the child died six days after operation. Post-mortem examination revealed a generalized peritonitis.

Case 2.—The second child was born on January 12, 1940, and admitted to hospital on February 2, 1940, at the age of 3 weeks. The history was that three days before admission the boy, who was well apart from mild icterus which dated from birth, started vomiting about half an hour after feeds. The vomit was not projectile but was copious. Constipation had been troublesome for a week. In hospital he was found to be moderately dehydrated and the abdomen was distended. Some jaundice was present. Visible peristalsis occurred and vomiting of a forcible character persisted after every feed. After correction of dehydration Rammstedt's operation was performed on February 5, and a typical pyloric tumour was incised. The condition after operation was good. Gastric lavage on one occasion showed a small amount of fresh blood, but all feeds were taken well and retained. Progress was satisfactory, and he was discharged 10 days after operation. Follow-up, four, eight, and 16 weeks later, showed that he was a keen, bright child, and was well nourished. Development was normal.

Case 3.—The third male child of the family was born on January 3, 1943, and was breast-fed for three weeks. Feeding was then changed to dried milk because of repeated small vomits after feeds. The baby was constipated. By the age of 8 weeks the feeding had been changed three times without any improvement in the vomiting or constipation, and it is remarkable that the condition was not suspected by the parents. When the infant was brought to hospital the vomiting was projectile, peristalsis was visible, and a pyloric tumour palpable. Two days after admission the boy was operated on and the thickened pyloric muscle incised down to the mucosa. After operation there was slight sickness, which was controlled for three days with "eumydrin." The child was discharged 13 days after operation, taking full feeds and gaining weight steadily.

In the later history of the two surviving brothers it is perhaps worthy of note that both boys had infantile eczema during the first year and both required removal of tonsils and adenoids at the same time in December, 1945. Subsequently, in May, 1947, both boys were in hospital at the same time for appendicectomy—in each case a history of acute severe abdominal pain with vomiting being given. The appendix of both children was inflamed and infected, that of the younger showing pus and incipient abscess formation. Inquiry into the family history has not revealed any other known relative in whom pyloric stenosis has occurred. The parents are not consanguineous. Both boys are at present in excellent health. The cases were admitted to the Royal Aberdeen Hospital for Sick Children under the care of Professor John Craig, who has kindly given permission for the publication of this report. My thanks are due to him for his help and advice.

—I am, etc.,

Aberdeen. JOAN M. BURRELL.

Dysentery in Monkeys

SIR,—With reference to the letter by Dr. R. E. Rewell and Colonel R. F. Bridges (October 15, p. 876), at the Central Research Institute, Kasauli, India, in 1940, in the search for a suitable antigen to be used in the event of epidemic dysentery in war, monkeys were used by me as experimental animals. These were immunized with a Flexner strain of antigen isolated from a suffering monkey and closely related in antigenic content—shown by reciprocal absorption tests—though not exactly similar, to one of the commoner Flexner human types. It was found that these animals could be immunized by doses of a detoxicated vaccine, details of the preparation of which can be seen in a paper published in 1942 (*Ind. J. med. Res.*, 1942, **30**, 213). The result of this research in the monkey as the experimental animal, using its own infective bacterium as antigen, added much to my belief in the efficiency of parallel methods of preventive T.A.B. immunization in man.—I am, etc.,

Glasgow. W. LEONARD FORSYTH.

Antiseptics for Minor Dressings

SIR,—May I comment on Dr. I. B. Sneddon's letter (October 1, p. 759), which rightly criticizes the local use of sulphonamides? Dr. Sneddon states that "penicillin powder is 99% sulphathiazole." This statement is liable to misinterpretation; the preparation which he presumably has in mind is a mixture of penicillin and sulphathiazole used for local application. The use of this mixture does incur, as Dr. Sneddon points out, the risk of a sulphonamide dermatitis.

In this hospital, however, we have found that a useful alternative is a mixture of penicillin and lactose. The lactose is sterilized by heating in a hot-air oven for eight hours at a temperature of 140° C., and when cool is mixed with calcium penicillin to give a final strength of 5,000 units per gramme of finished product. We have used this preparation for several years and have found it a convenient method for applying penicillin locally.—I am, etc.,

Hertford County Hospital. JOHN C. H. HANSON, Chief Pharmacist.

Conceptions of Right and Wrong

SIR,—Dr. Frederick Dillon (August 27, p. 485) asked for an authoritative meaning of the word "wrong" as it is used in the M'Naghten rules, and is resentful when Dr. J. E. Wilson, in replying (September 24, p. 711), seeks to give him his answer together with an authority for it, although he does so, somewhat unhappily in my view, by quoting at length the answers of the judges. If Dr. Dillon merely wished for an answer in terms of yes and no, as he states in his more recent letter (October 8, p. 818), he could have had it by reference to any good standard work—for example, those of Glaister or of Kenny. The latter, indeed, in his *Outlines of Criminal Law* has added the word "morally" in summarizing the judges' answers.

That morally wrong and not legally wrong is the meaning was finally established by the Court of Criminal Appeal in 1916, when the question was considered by that court in the case of Rex *v.* Codere, but morally wrong not by the standard of the accused, as Dr. Dillon would apparently construe it, but by "the ordinary standard adopted by reasonable men" with reference to the particular act. Further, if the prisoner knew in actual fact that the act was contrary to law it must be presumed, at least in the case of serious crimes, that he knew it to be wrong by that ordinary moral standard.

It will follow from this, therefore, that if prosecuting counsel can prove, as the Attorney-General sought to do in the Haigh case, that the prisoner knew the act to be wrong legally, then he must be taken to have known it to be wrong morally, as required by the rule. Even before Rex *v.* Codere a prisoner such as Haigh who knew his act to be legally wrong would have been held responsible on the authority of the first of the answers of the judges, already quoted by Dr. Wilson.

Much righteous indignation and sympathy for the criminal appears to be wasted by medical men on account of the supposed inadequacy of the M'Naghten rules. The function of the law is to protect the community, and, while with a better understanding of insanity there has been a gradual widening in the application of these rules, it must rest with medicine to throw more light on mental disease and so make possible a revision of the law, unless, indeed, the probable abolition of capital punishment reduces their importance.—I am, etc.,

Aberdeen. DOUGLAS MCBAIN.

Distinction Awards for Consultants

SIR,—The history of the dispute on this subject is discussed at some length in your leading article (October 1, p. 745). The writer gives the impression that there was no criticism of the report of the Spens Committee on remuneration of specialists at the time of its publication (June, 1948). That this was not in fact the case is shown by consideration of my letter in the *Journal* of July 3, 1948 (p. 48), quoted in your leading article in the same issue (p. 31). Although my letter expressed warning and criticism of the proposed method of making distinction awards and was, I believe, the first one published in your journal at that time, I made it quite clear that my views, though personal, did in fact represent the views of other specialists, if not indeed the majority of consultants.

It is necessary to remind ourselves that most specialists are far too busily engaged in medical work to find time to express their opinions through your columns on the multitudinous weaknesses of the health services; more especially is this the case when these opinions are in agreement with previous correspondence. Such was the position in July, 1948, and it is unfair to suggest that voices were silent until that of Dr. F. M. R. Walshe was heard on August 13 (p. 383). I am the first to acknowledge precedence to the letter of Dr. Walshe in weight and authority, but I do claim that my letter had precedence in time to the extent of over one year and anticipated with a warning the troubles to come.

I range myself whole-heartedly behind Dr. Walshe in his utterances on this subject, and view with horror the threatening statement of Dr. H. E. A. Boldero (September 10, p. 594) that "money for these awards will not be available for any other purpose." If Dr. Boldero seriously believes that the specialists of this country want to grab as much money from the taxpayers as they can for distinction awards at the expense of the harmonious unity of the profession I cannot imagine what he takes us for unless he likens us to a hungry flock of vultures each struggling for the greatest part of the prey. Far more would we prefer to see the money handed back to the taxpayers on whose shoulders the exorbitant expense of the Health Scheme depends.

The one sensible suggestion for the distribution of the fund is made in your article—that it should be made available for posts in the higher grades of the Service. Although these would probably be whole-time posts, as a part-time consultant I would far prefer that the fund should be distributed evenly for all full-time consultants in compensation for their less pleasant terms of employment and their inability to pursue private practice, which the Minister has unsuccessfully striven to destroy. In this way we should at least avoid the demoralization of the present set-up, in which specialists are empowered to assess the merits of their colleagues in secret communications. Rather than by using public funds to disrupt the harmonious co-operation of specialists which has been a feature and a legacy of the past, surely we should strive to preserve the spiritual and moral qualities of our calling—qualities which are of far greater worth than extra financial remuneration.—I am, etc.,

Windsor. PHILIP H. WILLCOX.

Acknowledgments to Authors

SIR,—It is good that Sir Stewart Duke-Elder in his review of *Modern Practice in Ophthalmology, 1949* (October 22, p. 913) should remark upon the undesirability of using illustrations without acknowledgment to the authors of them—"an omission which, it is hoped, will not become a practice in British medical literature."

An author who uses an illustration without acknowledging its source cannot well escape the implication that it is his own. In a book just published are two illustrations: one is taken from a presidential address of the Ophthalmological Society, the other, a particularly good coloured plate, is taken from another book. Not only are these used without acknowledgment of any kind, but in the case of the latter the author has taken upon himself to alter the caption.—I am, etc.,

Salisbury. R. FOSTER MOORE.

Encouraging the Blood Donor

SIR,—The excellent work of blood depots and hospital transfusion departments has ensured against grave shortage of supplies of blood, but few hospitals can claim to have optimum stocks of blood all the year round. There are occasions, especially in holiday time, when stocks are low, even lamentably so, and on such occasions the admittance of a severe case of bleeding peptic ulcer or a severe pregnancy haemorrhage may be frightening. The necessity for giving Rh-compatible blood has increased the seriousness of low blood reserves, and the

advent of our new medical service is, of itself, unlikely to stimulate voluntary donation, rather the reverse. It behoves us, therefore, to consider the factors influencing the supply of blood to a hospital. These fall into two overlapping groups—factors affecting the enlistment of donors and factors concerned with the maintenance of established donor panels.

There is a strong tendency for the average individual to avoid thinking of personal responsibility in blood donation. Much more could be done to increase supplies by well-planned information in the Press, the cinema, the church, and even the radio to increase the feeling of personal responsibility. Comparatively few realize the sometimes enormous expenditure of blood in a modern hospital. The public would, I am confident, be more inclined to offer their services if they were impressed by more facts and given facilities for seeing for themselves what is done and what is required. Our present panels of unselfish citizens are proof that no monetary inducement is essential, though by way of compensation the French system of allowing additional food rations might be adopted.

Many would-be donors are deterred by a strong fear of blood-letting. Fear can be largely dispelled by allowing people to see for themselves how blood is withdrawn painlessly and by emphasizing the vital role of the blood donor in the recovery of so many hospital patients. Satisfied donors are themselves excellent agents for dispelling fears amongst their friends and acquaintances. A few energetic, public-spirited doctors have addressed groups of young adults (e.g., in youth clubs), thereby winning their interest and services in transfusion work. Such efforts could well be emulated by doctors, young and old, who are sufficiently interested in the welfare of their hospital.

In certain parts of the world, notably the U.S.A., blood expended on a patient has to be replaced in kind by a member of the family, where circumstances permit. Blood donors are paid for their blood in cash. The enlistment of healthy relatives, especially young adult relatives, as blood donors might be considered as a possibility in this country. Tactful inquiry and gentle persuasion on the part of the doctor could enlist the services of many helpers from this family source.

The blood donor is such a precious unit that particular care should be exercised in all our dealings with him or her. This implies, amongst other considerations, a courteous welcome, painless blood-letting, and appropriate refreshment in pleasant surroundings. The dissatisfied donor is unlikely to return. He may be dissatisfied with the abrupt wording of the letter from the hospital reminding him of his appointment, which perhaps reminds him more of income-tax returns than a mission of mercy. Or he may be displeased with the cold reception at the hospital or the clumsy and painful technique of doctor or nurse. He is unlikely to overlook lack of gratitude for his services. All donors deserve appreciation, especially those who have given many pints of blood or who have answered emergency calls. A personal letter from a senior hospital doctor would be a fitting expression of gratitude in these instances.

A donor panel can be adequately maintained only by constant vigilance and attention to detail. Many donors quietly drop their services either because they leave the neighbourhood or because they no longer wish to donate blood. In either case it frequently happens that the hospital is not informed of the termination of their services in good time. A blood donor panel, like clothing, requires constant repair and replacement.—I am, etc.,

London, S.W.17. A. WYNN WILLIAMS.

Co-ordination of Tuberculosis Schemes

SIR,—The figures quoted by Sir Andrew Davidson in a recent address, reported in the *Journal* of October 8 (p. 806), give convincing proof of the seriousness of the tuberculosis problem in Scotland. Sir Andrew states that the reasons for the continuing high incidence and mortality have not been elucidated. Doubtless there were, and are, many factors outwith control, but have there not also been administrative mistakes that could have been avoided?

For example, even when it became apparent that the servicing of sanatorium beds would be difficult for some time to come no country-wide move was made to make good the deficiency, in part at least, and temporarily, by the fullest possible use of the fever hospitals, where beds and staff were available. Had this been done our waiting-lists would not be so large to-day. Instead, cases in all stages of the disease, many of them highly infective, have been allowed to drift into the medical wards of general hospitals, where other patients, staff, and visitors provide contacts that may number hundreds every week and where adequate preventive measures are impossible. This surely violates every principle governing the treatment of infectious disease. If such cases are to be accommodated in general hospitals it must be in special wards, where conditions can be made to approximate sanatorium ideals.

Later in his address Sir Andrew Davidson advised that "the best possible use should be made of all hospital accommodation irrespective of the functions for which it was originally provided." I trust that in so saying he had in mind the use of special accommodation in general hospitals, and the valuable contribution that the infectious diseases hospitals could make to the solution of this problem.

Further, should not priority be given to all measures aimed at erasing this black spot from Scotland's health record? Any outbreak, however small, of enteric fever or infantile paralysis calls for and obtains immediate mobilization of all the forces at the command of the health authorities, and rightly so, but a similar sense of urgency has been lacking in the official attitude to the tuberculosis problem. Nor is it discernible to the degree that one could wish in the new hospital service, though efforts are being made to find more beds.

One might have expected in the recent grading of specialists some recognition of the magnitude and importance of the task facing workers in this field. But it would appear that the establishment of consultants in tuberculosis is likely to compare very unfavourably with that of other specialties. How, then, is the best type of recruit to be attracted to this vitally important service?—I am, etc.,

Dundee. G. RANKINE.

Fat Absorption

SIR,—A friend has suggested to me that a sentence I used in my Sharpey-Schafer Memorial Lecture (*Journal*, October 1, p. 719), when not considered in relation to its context, might give the impression that there may be no danger in the unrestricted use of mineral oils, either medicinally or as fat substitutes in food.

I must therefore correct that impression if it exists. Referring to the experiments of Frazer and his colleagues on the absorption of extremely fine emulsions of paraffin, I said: "Some alarm has been expressed on this account at the use of medicinal paraffin as a medicament and in cooking." In saying this I was solely concerned with the question of evidence that *dangerous amounts* of paraffin are actually *absorbed* from the intestine when it is taken by mouth in the ordinary way. This does not mean that there are not other dangers. Students of nutrition know them well, and they were referred to in a leading article in the *Journal* (June 12, 1948, p. 1141). With these, however, the lecture was not concerned.—I am, etc.,

Manchester. H. S. RAPER.

POINTS FROM LETTERS

Transmission of Syphilis

Dr. JESSIE M. CRAWFORD (Dartford) writes: Dr. Philip Simon's letter (October 8, p. 815) shows how very important is the taking of a blood test in every pregnant woman regardless of social standing or anything else. It is not necessary to take a case history from the syphilitic point of view till after a positive finding. Even then tact can elicit the necessary facts, and if the husband can be got to take treatment *pari passu* with the wife no apportioning of blame or breaking up of family relationships need ensue. So many people seem to sheer away from the question of syphilis because of the moral issues involved, particularly when an unexpected positive is found. It seems to me, especially now in the aftermath of war, that no one can afford to shirk his or her responsibility to the future generation in this respect. The modern child has a hard enough way to hoe without having the disadvantages of inherited disease thrown in.

Obituary

SIR RICHARD NEEDHAM, C.I.E., D.S.O., M.D. F.R.C.P.Ed., F.R.C.S.

Sir Richard Needham, who died at his home in London on October 24 at the age of 71, was for six years Deputy Director-General of the Indian Medical Service. He had done valuable work as an inspector of medical studies in India, and visited many medical schools in both Asia and Africa on behalf of the General Medical Council and also of the Colonial Office. He had been a member of the Council of the British Medical Association for six years. One of the most distinguished members of the Indian Medical Service, Needham was a man who combined eminence in his profession—in hygiene, administration, and education—with a most lovable personality.

Richard Arthur Needham was born in 1877 and educated at Owens College, Manchester, where he graduated M.B., B.Ch. in 1899 at the early age of 22. He was a house-physician at the Manchester Royal Infirmary and later a demonstrator in anatomy at the University. He joined the I.M.S. in 1903. The Service was then at its zenith; competition was keen and the successful entrants were of notably high quality. Nevertheless Needham early attracted attention by his keenness, initiative, and capacity for hard work. He saw service in North China from 1905 to 1908, and his observations and experiences there turned his interests towards preventive medicine. As soon as he could —in 1910—he obtained his D.P.H. Returning to India, he was selected to accompany a special mission to Tibet in connexion with the repatriation of Chinese troops from that country. Here his duties were largely preventive in character and were performed with great ability.

On the outbreak of the first world war Needham was appointed D.A.D.M.S. (Hygiene) at the base at Marseilles, and was responsible for the medical organization of the many transit camps which were established there and for the care and well-being of thousands of British and Indian troops who passed through that port. It was his conspicuous success in this difficult task which first brought to general notice his outstanding organizing ability, earned him his D.S.O., and dictated his next appointment as Officer on Special Duty in connexion with medical supplies to Mesopotamia after the breakdown of 1916. Equally successful in this assignment, for which he was awarded the C.I.E., his selection as Deputy Director-General in 1918 followed almost as a matter of course. This exacting appointment gave full play to Needham's great capabilities. It brought him into contact with almost every officer in the Service. He was faced with medical and health problems, including those of medical education, over the whole of the subcontinent, which he toured extensively. Widely consulted on all matters of medical administration, his opinion commanded universal respect.

Towards the end of his tenure as D.D.G., Needham was made inspector of medical studies in India on behalf of the General Medical Council, an activity that continued throughout the remainder of his service. Medical education in the two new Dominions owes much to this day to his efforts and to the high standards on which he insisted and on which he persistently refused to compromise. On relinquishing the post of Deputy Director-General he was placed on special duty to work out the constitution of a medical service for the Indian State Railways. The organization he created continues in operation with the efficiency which stamped all his work. He proceeded to the degree of M.D. in 1920 and was elected F.R.C.P.Ed. in 1924. In 1923 and again in 1927 Needham represented India at the international sanitary conferences held in Paris. He retired from the I.M.S. in 1930 and was knighted in 1932. After his retirement Needham continued his work for the G.M.C. as its visitor to medical colleges abroad. He went to India again, and he reported on the state of medical education there and in Rangoon, Ceylon, Singapore, and Hong Kong. In 1939–40 he also visited for the Colonial Office the medical schools of Nigeria and Uganda. In the recent war, though over 60, he accepted the invitation of the Indian Red Cross Society to serve as their Commissioner in Egypt, a position he held until the disbanding of the Commission at the end of the war. Here he gave of himself as unsparingly as ever but at a cost he did not realize at the time; permanently impaired health was the price he paid for his strenuous exertions in Egypt.

Needham's clear, lucid mind, his quick grasp of essentials, and his power of succinct expression made him a remarkably fast worker; the amount of work he crammed into a day was prodigious. Yet he never appeared hurried, and always found time to listen to, and generally to help with, the problems of others. Genial and generous to a fault, he was intolerant only of slackness or subterfuge; these he hated and exposed ruthlessly. On the other hand there was no limit to the trouble he would take to help and promote the interests of men of his Service who he thought were "doing their stuff." Many of his juniors, among them the writer, will cherish the memory of his spontaneous kindness, his sound advice and warm championship, and his generous and delightful hospitality. India and the I.M.S. owed much to Dick Needham. Now India has lost a devoted and disinterested servant, the Service one of its most distinguished sons, and we a comrade and friend whose like we shall not see again. The sympathy of all who knew him will go out to Lady Needham. —J.B.H.

A colleague writes: The most notable years of Needham's service in India were those in which he was Deputy Director-General of the I.M.S. During this period he was one of the most prominent and popular figures in the official and social circles of Simla and Delhi. Both of the distinguished chiefs under whom he served relied on him to such an extent that he was generally looked on as the power behind the throne. It is no secret that, when the post of Director-General was about to become vacant through the retirement of Sir Charles MacWatt, Needham was regarded by his administrative colleagues in the Government of India as the most suitable officer to fill the vacancy. Indeed, he was exceptionally well qualified for the appointment in every respect, save only that he lacked the degree of seniority considered essential for the post. In the circumstances it was necessary to find another appointment for him, but owing to the long period during which he had been engaged in purely administrative work he came to the conclusion that he could not fill with satisfaction to himself the appointment to which he was gazetted or any other likely to be available for several years. Accordingly he felt compelled to take long leave preparatory to retirement, and his career in the Service was thus ended prematurely for no other reason than that he had achieved outstanding success at too early a stage.

In spite of his natural disappointment Needham did not yield to a feeling of frustration; he soon found an opportunity for undertaking a very important task for which he had unique qualifications. This was to serve on the Council of the British Medical Association and act as

honorary adviser to the B.M.A. in its conduct of a campaign for the defence of I.M.S. officers against a concerted attempt to deprive them of the rights and prospects which had been held out as inducements to persuade suitable candidates to enter the Service. His unrivalled knowledge of Service matters was of the greatest help to the Association in the long struggle that followed, and the I.M.S. was indeed fortunate in having so able an advocate, especially as its members, serving mostly in isolated posts all over India and Burma, had no organization for the defence of their interests. Needham had the satisfaction of knowing that his voluntary efforts earned for him the high esteem of his fellow officers, but only those associated with him in the negotiations were able to realize the full extent of the debt of gratitude owed to him by every member of the I.M.S.

Wing-Commander H. M. Stanley Turner writes: It was a shock, not only to me but to my family, when we heard of the death of Dick Needham. We saw a lot of him in the days when he was on the Council of the B.M.A. and the Naval and Military Committee—in the days when we were trying to improve conditions of service for the Medical Services of the fighting forces. I have a lively recollection of innumerable informal committee meetings in my bedroom at all hours of the day and night during the annual meeting at Bournemouth, when wheels were busily working within wheels. Goodbody was chairman of the Naval and Military Committee at the time. Needham had a great sense of humour, but he never lost sight of the matter under consideration, although one could see by the twinkle in his eye that he never missed the funny side. He had a very clear and logical mind, which with his great Service experience and tact made him a tower of strength in our deliberations. He quickly grasped points under consideration which might easily become "sticky" with non-Service members of the committee. Both he and I were but recently out of the Service and had not had time to lose our knowledge of the probable reaction of the official mind to matters put forward by the B.M.A. I think this was of assistance both on the Council and in committee. His wide travels and outstanding work in connexion with medical education in our overseas possessions are too well known to require any word from me; but I have always regretted just missing him in Ceylon when he was there in that connexion. I always remember during the Bournemouth meeting in 1934, after a long period with our noses to the grindstone, he and I decided to give a miss to one of the many social functions and have a night out with my wife and young daughter in a sort of fun fair. He was just like a schoolboy let loose, and we had a most hilarious time sampling all the sideshows. We still speak of it. Needham will be badly missed.

J. E. BARNARD, F.R.S.

Mr. Joseph Edwin Barnard, who was well known for his work on ultra-violet microscopy, died at his home at Addiscombe, Surrey, on October 25 at the age of 80.

At a very early age, although still engaged in his father's business, he began to spend most of his spare time at the Lister Institute, taking a special interest in microscopy, and particularly in photomicrography. He soon became expert in this field, and his book *Practical Photomicrography*, written in collaboration with Mr. F. Welsh, was regarded as the standard work on this subject. Mr. Barnard was well known to many members of the medical profession, and his work at the National Institute for Medical Research on the study of applied optics gained for him his F.R.S. He worked in close collaboration with Dr. W. E. Gye for many years.

Dr. W. J. Purdy writes: With the passing of Mr. J. E. Barnard we have lost from our midst one who was perhaps the most eminent microscopist of the recent past, and in those who knew him there must arise a feeling of personal sorrow. To many of us it seemed that the outstanding characteristic of the last years of Mr. Barnard's scientific life was his singleness of purpose, his consecration to the development of the ultra-violet microscope. He early recognized the advantages to be gained by the use of wavelengths shorter than those of visible light if only the technical problems involved could be solved. He already possessed a simple ultra-violet apparatus of German origin, and, setting himself the task of improving on this model, he entered a field of research which for long remained his own. As the work progressed Mr. Barnard became more and more able to throw valuable light on various current biological problems, but in spite of considerable success in this direction he forced himself to keep such interests under control. The surveying of fields which the ultra-violet microscope began to open up could be left to others; his own special task must be the devising of ever better means of doing such work.

Mr. Barnard maintained that for him there were two associated lines of inquiry. These were the improvement of the ultra-violet microscope itself and the improvement of methods of preparing material intended for examination. He held that neither line could be pursued very far without helpful advances in the other. He did pioneer work on the internal structure of bacteria and on the nature of "inclusion bodies." He also brought forward evidence that the larger viruses at least—the larger filter-passers—were only micro-organisms which happened to be too small to be seen under existing microscopes of ordinary type—a quite artificial standard, he maintained. But still, one suspects, all this biological work had its main value for him in that it provided useful exercises in the development of the ultra-violet microscope and the methods of using it in biological studies. Indeed, he remarked on the splendid biological test objects these tiny living particles provided for him.

Mr. Barnard's singleness of purpose led to some charges of lack of co-operation with colleagues who themselves had problems demanding investigation along lines which at that time only Mr. Barnard could have followed. But it was seldom realized how much subsidiary investigation of the material itself might be necessary before microscopical investigation proper could begin, and that the evolution of his microscope might be correspondingly delayed. Though director of the Department of Applied Optics in the National Institute for Medical Research, Hampstead, Mr. Barnard preferred to remain a voluntary and part-time worker, earning his living by part-time attention to his business. He seems to have preferred to remain relatively independent in his scientific activities and thus so much the more free to direct his own course. The result is that the world now has the wonderfully efficient ultra-violet microscope he left when failing health overtook him. This microscope has now been copied in its main features and made commercially available, and its potential value is being appreciated more and more. Notwithstanding the recent introduction of the electron microscope with its surpassingly high resolving powers, the ultra-violet microscope still has a sphere of usefulness all its own. With it cells and micro-organisms can be examined in the living condition and in various wave-lengths of the ultra-violet range. Recently indeed differential absorption in the ultra-violet

range has been much used for the identification of certain organic substances whilst these are still *in situ* in the living cell.

Mr. Barnard early showed signs of his dominant interest, and he retained a vivid memory of the scene which occurred when his father discovered that leave of absence during business hours—leave which had been reluctantly granted for the study of languages conceivably useful in business—had been secretly used to attend classes in optics. He early became an active Fellow of the Royal Microscopical Society, a body whose welfare was ever afterwards very near to his heart. It fell to him to give the presidential address at the society's centenary. In this he reviewed the previous fifty years of the history of the society, a period which coincided exactly with his own period of membership. To some of us it seemed a pity that in that address he refrained from giving the inner history of the many exciting periods of the early days. Now there is no one who can do this from personal knowledge. He was an able and fascinating lecturer on his own favourite subject, but he seemed not to enjoy writing scientific papers. Towards the end of his scientific career he collected much material for a book he contemplated on the ultra-violet microscope, its structural details, and the technique of preparing objects to be examined. Unhappily this book was never actually written. Had it been ready for publication about the time of Mr. Barnard's retirement from active work it would have been of great help to those who were following on. By now much of what he discovered and taught has passed into the general body of knowledge. There remains, however, no clear summary of all that he did for the science he loved.

It is perhaps in relation to details that Mr. Barnard's genius shone most brightly, and indeed it was his technical ingenuity that proved so valuable in the development of his microscope. One seldom visited his laboratory without experiencing a fresh thrill of admiration on discovering some new simple device for overcoming some new difficulty that had been encountered in the course of his work. At one time Mr. Barnard was a keen amateur photographer, and in his laboratory at Hampstead there used to hang a photograph which had won him an "Alpine Prize." This interest in photography, of course, helped to fit him for his studies of ultra-violet light. After the first world war he played an important part in stimulating improvement in English standards of microscope design and manufacture. His mechanical and optical knowledge fitted him particularly well to act both as a destructive and as a constructive critic. The microscope he designed about this time had many valuable qualities.

Mr. Barnard was one of the last survivors of that band of kindred spirits, all amateurs, who years ago used to meet in the rooms of the Royal Microscopical Society, and he remained a true amateur to the end. Often he would recall how in those days meetings generally lasted to a very late hour, discussions being carried on with a zest and candour rarely encountered now. In the direction of the society's affairs his business knowledge and ability were invaluable, while his unassuming nature and his personal integrity, in scientific thought as in private life, were not the least of his admirable qualities.

C. O. HAWTHORNE, M.D., F.R.C.P.

Dr. Alfred Cox writes: "Men must endure their going hence even as their coming hither: ripeness is all." If ever a man of my acquaintance could claim a ripe old age it was Hawthorne. Over 91 at the end, though his physical faculties had declined, his intellect and judgment seemed to me to ripen. He was one of the finest ornaments of our Association, which has had many great figures. His achievements are well known and his departure is mourned by all who ever worked with him. Our Association gladly gave him every honour in its disposal, and Hawthorne greatly enjoyed them, but even more, I think, the real affection which he knew he had inspired. Full and successful as his career was, I have good reason to know that he felt that he had missed the position for which he was peculiarly fitted. He was a born teacher, but except for his early days in Glasgow, where his classes are still gratefully remembered by men, now old, who were his pupils, he never had the opportunity for which he longed. He told me that his greatest professional regret was that he never had a teaching-hospital appointment. He looked longingly back on his close association with Gairdner, for whom he had the greatest respect. But our Association has every reason to be grateful that he devoted his gifts to its service—his learning, his wide reading, his sagacity, his wit and humour. I should rank him very high among the many able chairmen I have known. His command of the Representative Body was masterly. The dignity and authority of the chair were never in doubt when he was in it, but he ruled quite as much by the affection all felt for him as by his authority. For many years he was the ideal chairman of one of the most difficult committees of the Association—the Central Ethical Committee. His work on the Library Subcommittee, though it never reached the limelight, was invaluable. And it should not be forgotten that he was a very active member of the original Building Committee, as is commemorated in the inscription (now almost unreadable) on the stone near the entrance gate at B.M.A. House.

I must not try to enumerate all that he did, or describe all that he was in and to the Association. Space forbids. Nor am I the right person to assess his professional status. But I know many practitioners who had great comfort and support from him as a consultant. I well remember that, being asked by an important firm to recommend "a good general physician who could be relied on for an honest opinion on the capacity for work of our higher officials," I had no hesitation in nominating C.O.H., and was not surprised when some years later I was thanked by one of the directors for helping them to secure a man in whom they had felt complete confidence.

His outside activities should not be forgotten. He did good work on the People's League of Health, especially in its pioneer work for "Safe Milk." Hawthorne would have nothing to do with less aggressive terms like "clean" or "pure" milk. We should be content with nothing less than "*Safe* Milk." He took an almost lifelong interest in the Royal Medical Benevolent Fund, and was, until he left London, the sagacious and humane chairman of its case committee. Nor should his work at the polyclinic in Chenies Street be forgotten, as I am almost afraid it is. This was real pioneer work in postgraduate medical teaching which he shared with Sir Jonathan Hutchinson and a few kindred spirits.

It was my privilege to be in close contact with him until the day of his death—personal contact when he was in London, by weekly correspondence afterwards. On the day preceding his death he dictated a letter to me which characteristically was an attempt to put me right about the proper way of dealing with that tricky term "our mutual friend." His letters were a joy. There was scarcely one which did not contain some epigram or a well-balanced sentence well worth remembering. His reading was very wide and deep. I think his favourites were the Bible, from

which he would often quote, Dr. Johnson, and Sydney Smith. In his measured sentences it was easy to trace the Johnsonian influence, and he was not displeased when one told him so. His remarkable memory enabled him at any time to produce the apt quotation or anecdote, and his *ex cathedra* speeches were eagerly anticipated and joyfully received by his audiences. He more than once delivered addresses of a popular medical character in churches—once at least in St. Martin's Church.

I was never able to draw him out on the medico-political subject which has engrossed our attention lately. He was always eager to know what was going on in Tavistock Square, and I did my best to keep him *au courant*. But he declared that he was now "out of the combat" and it was not seemly for people "on the shelf" to intervene; but no man I have ever known was a more determined upholder of professional freedom. He had his sturdy prejudices and was always ready to defend them. One of them, at one time the cause of a good deal of amusement in our Council, was his objection to any special franchise for medical women. "The qualification for election to this body," he said, "should be good honest work in the Divisions and R.B. There is no more justification for special representation of women practitioners than for practitioners endowed with the glory of red hair."

We are unlikely soon to see his like again. In spite of his age he retained active sympathy for his younger successors, and nobody was more pleased than he when he saw an opportunity to send an encouraging or congratulatory letter to an old friend. Dr. Hawthorne's wife died some years ago, but he was tended with loving care by his sister and by a faithful housekeeper who served him for twenty-four years, both of whom were with him at the end. In one of his latest letters he spoke very feelingly of the attention given to him by Dr. J. M. Anderson, of Hove.

Dr. A. G. Newell writes: I wonder how many of the students who took some of Dr. Hawthorne's classes at Glasgow remain. He had classes for each year of the medical curriculum—chemistry for first-year students, physiology for the second-year, materia medica for the third, and medicine, the eye, and medical jurisprudence for the final-year students. I took each of these, and each was "run after" and well attended. He was a born teacher, and all students appreciated his patience. Since he became a consultant I have frequently sought his excellent services, his kindly manner, and the meticulous care he took. To show his kindly and generous character, he has come from Harley Street late at night to see a case without a fee. He was a great physician and a friend of the general practitioner. Those who knew him miss his magnanimous character.

Miss Lina M. Potter writes: The death of Dr. Hawthorne will be regretted by the older generation of doctors. It is forty years since I listened to his lectures on medical jurisprudence. There has hardly ever been a year since in which I have not been grateful to him for some bit of wisdom. Looking through my notes I find this as typical of his clarity and caution: "In giving evidence—speak audibly. Don't use technical terms. Speak the truth wisely and not too well." He tried to instil into us what he described as "a medical atmosphere," which included medical etiquette and many other things besides. Subsequently when I sat under his presidency at meetings of the Representative Body I was able to appreciate other qualities. He was always strict, always fair, and never got "across the meeting." He made us laugh at ourselves sometimes but never at one another.

Dr. ALEXANDER MACINNES died at his home in Skye on October 9 after a very short illness. A native of Kylerhea, Skye, he served with the Cameron Highlanders during the 1914–18 war, and graduated M.B., Ch.B. from the University of Glasgow in 1928. For two years he acted as assistant medical officer to St. Mary's Hospital, Portsmouth, where he met his wife, then Sister Alice Boyd. He was subsequently appointed as parish medical officer to Sleat, Skye, under the Highlands and Islands Medical Service Scheme of the Scottish Department of Health. In August, 1935, he received a similar appointment as medical officer for the parish of Strath, Skye, moving then to Cairn Villa, Broadford. Dr. MacInnes had always been interested in surgery. Since he settled in Skye he had been associated with the MacKinnon Memorial Hospital, Broadford, and he was soon recognized as a surgeon of considerable ability and one on whom his island colleagues could rely. As recently as January of this year he was presented with a cheque for over £500 and his wife with a gold wrist-watch as marks of the esteem and affection of the people of Skye. Tributes were paid to their long and faithful service to the community.

W. D. M. writes: Alexander MacInnes never spared himself. He was always willing and eager to help under the most difficult and adverse conditions. An example from my own area was that of an old lady, aged 79, residing on an island. She had an acute abdomen, and the weather was stormy and the steamer unlikely to call at the pier. I phoned "Sandy" MacInnes to see what could be done. Two hours later he arrived by motor-boat, at risk to his life, with the matron from Broadford Hospital and some operating kit. On the kitchen table he performed a reduction of a volvulus safely and satisfactorily. The lady died five years later from other causes. His last 16 years' work included some notable cases: caesarean section successfully performed on a cow; a horse gored in the flank by a bull; broken spine of a dog plastered; 17-inch resection of colon; multiple duodenal perforations; and at least eight urgent mastoidectomies. Hard work and worry had of late told their tale, yet his death came as a shock to us all. I heard his cheery laugh a week before I saw him dying. He is mourned all over the island, and his funeral was one of the largest on record. About 800 people attended the service in Strath Parish Church, and over 300 people, including 14 of his colleagues, followed the cortège to Kilmore Churchyard in Sleat. A benefactor to hundreds, he was a man much loved by the people and beloved by his colleagues. We shall miss him, and to his widow and four children all extend their heartfelt sympathy.

Dr. C. Killick Millard writes: In your interesting and appreciative obituary of the late MAJOR GREENWOOD (October 15, p. 877) many aspects of his work and character are dealt with, but no reference is made to the fact that he was a firm believer in and advocate of the legalization of voluntary euthanasia. May I mention, therefore, that for many years he had been a member of the Consultative Medical Council of the Voluntary Euthanasia Legalization Society, and he was selected to put the case in favour of voluntary euthanasia in the broadcast debate arranged by the B.B.C. early this year.

Dr. H. C. Maurice Williams, in concluding his presidential address to the Society of Medical Officers of Health on October 20, said that there were still many unexplored fields for the medical officer of health in his work of acquiring an accurate knowledge of the influences, social, environmental, and industrial, which might operate prejudicially to health in his area. A closer link with industrial medicine, and investigations into the increased incidence of psychosomatic diseases, which played such a big part in present-day sickness, were necessary. An extension of the mental health services, a reduction in the accidents that occurred in the home, and the care of the aged were but a few of the many conditions that required attention. The promise of information from the Ministry of National Insurance relative to morbidity statistics should help them in assessing the local influences causing sickness.

Medico-Legal

MORPHINE FOR MOUNTAINEERS

Surgeon Fined

On October 26 proceedings were taken under the Dangerous Drugs Act against Mr. Wilson Harold Hey, a well-known Manchester surgeon.[1] Mr. Wilson Hey pleaded guilty to a charge of failing to furnish information about his supplies of morphine to a Home Office inspector. Another summons alleging obstruction of the inspector was withdrawn by the prosecution.

Mr. M. J. Jardine, who appeared for the Director of Public Prosecutions, said that on August 15 the Home Office received a letter from Mr. Wilson Hey headed "Mountain Rescue Committee." It recalled that in 1934 he had asked permission from the Home Office to include morphine in the equipment which was left at first-aid stations which had been set up by the Mountaineering Club. In this letter Mr. Wilson Hey said he understood that morphine was being used in similar circumstances in mines and on airfields. His letter concluded: "I would be extremely obliged if you could give permission; or, if you cannot do this, will you take legal proceedings against me?"

Mr. A. D. Gerrard, K.C., described how Mr. Wilson Hey had himself been a keen mountaineer for many years. He and others had been pressing for some form of rescue service in the mountains. In 1934 he came to the conclusion that morphine should be included in the first-aid equipment to be left at certain depots in mountainous districts, and he felt that "public need overrode departmental inertia." When he wrote to the Home Office in August he thought that the official attitude might have changed, as it was proposed that morphine should be used in pit accidents. Mr. Gerrard added that it was generally accepted in the medical profession that it was most important to give morphine on the spot in the case of fractures sustained while mountain climbing. Strict supervision had been exercised over the supply of morphine at the 27 first-aid stations. In the fifteen years since Mr. Wilson Hey had initiated this supply only 1½ gr. of morphine had been unaccounted for—and some part of that was known to have been used in a particular fracture case. Mr. Wilson Hey had "paid for it himself, issued it himself, and kept a record, so he knew exactly what was going on."

The stipendiary magistrate, Mr. J. Wellesley Orr, said that Mr. Wilson Hey was a pioneer of this idea, and one honoured him for it. There was no doubt that he was acting on the highest motives, but he had flouted the law. He thought it would have been better if Mr. Hey had used the very powerful influence of himself and his colleagues to approach the Home Office in a body. He was struck by the fact that nothing had apparently been done by some recognized authority to bring about a change in the law. But Mr. Hey was not entitled to defy the law.

The defendant was fined £10, with 10 guineas costs.

OVERDOSE OF NITROUS OXIDE

At an inquest held in Dublin on May 31 the jury found that the death of a woman of 38 was due to anoxaemia and cardiac failure following an overdose of nitrous oxide (*Journal*, August 27, p. 490). Subsequently the anaesthetist in this case had to appear at the Dublin District Court (October 22, p. 934). A civil action brought by the husband has now been settled.[2] The husband sued on his own behalf and on behalf of his four children the doctor concerned and the Adelaide Hospital, Dublin. It was stated for the defendants that a payment of £1,000 would be made *ex gratia* and without admission of liability. In accepting this settlement Mr. Justice Dixon allocated the money as to £700 in varying amounts to the children and £300 to the father.

[1] *Daily Telegraph*, October 27, 1949.
[2] *Dublin Evening Herald*, October 28, 1949, p. 3

Medical Notes in Parliament

NURSES BILL

Mr. BLENKINSOP in the House of Commons on October 21 moved the second reading of the Nurses Bill. This Bill had already passed the House of Lords.

Mr. Blenkinsop expressed the regret of Mr. Bevan in being unable to introduce the Bill in the House. He said that recruitment of nurses was steadily improving and the number of both full-time and part-time nurses was increasing. The total nursing and midwifery staffs of all grades working full-time in hospitals in June, 1947, was 116,500. By June, 1948, it had risen to 118,700, and by June this year to 137,000. Part-times nurses had increased from 10,700 in June, 1947, to 17,400 in June, 1948, and 22,800 in June, 1949. There had been a gratifying increase in the number of staffed beds, but empty beds in the hospitals still showed the urgent need for more nurses.

The General Nursing Council during these difficult years had done much to improve the high standards of nursing in this country. Part of the difficulty in recruiting nurses and of the problem of those nurses who left during training was due to a conflict between the needs of training and those of staffing in the hospitals. Too often training had to take second place to staffing needs. The object of the Bill was to see that attention was given to the training of nurses. The Bill gave new responsibilities to the nursing profession through the General Nursing Council to develop the best forms of training and provide for new experiments in training where these were felt to be desirable. The Bill would also give the General Nursing Council more intimate contact with the training hospitals through the institution of regional committees. Election of nurses to the General Nursing Council, as proposed in the Bill, would give nurses a greater interest in their profession and in the Health Service as a whole. All these things in the Bill would encourage recruiting and help to stay the wastage. The strengthened Council would be supported by fourteen Standing Nurse Training Committees including representatives of regional hospital boards and teaching hospitals as well as of the General Nursing Council, the Central Midwives Board, local authorities, and educational interests. There would always be a majority representation of nurses on each regional committee.

Funds for training would be provided by the Exchequer separately and would be distributed by the General Nursing Council to regional committees. There would be a new finance committee of the General Nursing Council to watch over budgets submitted from the regions, to co-ordinate them, and to present them to the Minister. The Bill also provided for a mental nurses committee, and the training of mental nurses would now be within the ambit of the General Nursing Council.

The opportunity was also taken to provide for amalgamation of the supplementary part of the *Register* for male nurses with the general part as soon as the General Nursing Council amended its rules to admit male nurses. This recognized the fact that an increasing part was played in nursing to-day by male nurses. Last year some 20% of the nursing staffs in the hospitals of the country were male nurses. Another amendment to the 1909 Act opened the *Register* to nurses in any part of the world subject to the General Nursing Council being satisfied that training was up to British standards. The Bill did not propose that the form and contents of training should be laid down in any way by the Ministry. The Bill was a skeleton to which the professional body itself would give life. It had the approval of practically the whole of the nursing and medical professions.

Marriages and Resignations

Mr. WALTER ELLIOT said that the nursing profession contained the pick of the young women of the country, and it was not astonishing that one of the reasons for the high turnover in this industry was marriage. He objected to describing this turnover as wastage. It amounted to 15% in the voluntary hospitals, where the ratio was 15% marriage and 25% resigna-

tions. That was more healthy than the ratio in the sanatoria, which was 8% from marriage and 48% from resignations, or in mental institutions, where the ratio was 11% from marriage and 51% from resignations. The Bill was designed to improve the conditions to which various commissions had drawn attention and to diminish this great rate of turnover. The nursing problem still remained acute. His information was that beds staffed and occupied amounted to 398,000 and beds staffed but unoccupied to 56,000. The beds unstaffed were 52,000. The beds staffed but unoccupied were not beds out of commission. That 52,000 beds out of some 450,000 in all should be unstaffed was a weakness in the national attack upon disease. It was a sector where no assault was going forward although all the technical equipment was there for the assault to be made.

It was a grievous thing to see whole wards empty when the problem of tuberculosis was aggravated during every month in which an infectious case remained in contact with the community. The great teaching hospitals had waiting-lists of girls wishing to enrol. In addition to the prestige the interesting nature of the work was also a factor in increasing the number of girls who desired to enrol in these hospitals. He hoped the Government would indicate how the intake figures in England were moving. In Scotland these figures showed a fall in the nurses entering the profession. The entrance for the preliminary examination in Scotland was 706 in 1947 and 667 in 1948 and for the final examination 1,374 in 1947 and 1,217 in 1948. The increase in the numbers of part-time nurses was a useful development, but he did not look forward to the day when hospital nurses would pour into the gates each morning like typists into one of the great Government hospitals. He did not think that would be to the best advantage of the profession or of the patients. There was an atmosphere about nursing which induced many of those concerned in it to wish to live on the job. That of course brought in the danger of discipline degenerating into petty tyranny and the stereotyping of out-of-date conditions.

The wastage among nurses was much less in voluntary hospitals than in the local hospitals. Voluntary hospitals had solved the problems of human relationships more satisfactorily than had the local authorities. The flexibility of the private decentralized institution was an advantage compared with the more rigid rules of the State or local government institution. He thought the solution in the Bill of financial questions was a great advantage, the more so because the finances of the General Nursing Council were disordered and a deficit of £33,000 was anticipated this year.

Training at Voluntary Hospitals

Mr. MESSER, referring to the attraction of the voluntary hospital, said it was interesting in the teaching hospitals to find the pride which nurses and sisters had in their training schools. Parliament must ensure that the nurse could always take pride in the hospital where she trained. No nurse would ever say "I am proud of having been trained by the North-West Metropolitan Regional Hospital Board." An efficient ward sister was probably the most important officer in the hospital, and he hoped to see the time when their value would be recognized and they would be offered the attractions that at the moment were offered to take them away from their jobs.

For a long time he had criticized the syllabus issued for nurses by the General Nursing Council. It contained a great deal more than the practical nurse needed to learn. There was no reason why the nurse should not obtain additional qualifications in the same way as a doctor did. Was it not possible that, after she was trained she could be able to get a tuberculosis certificate and other certificates dealing with children and so on?

Brigadier PETO said it would be a mistake if the teaching hospital was put on the same footing as other hospitals for nurse training and the receipt of grants. To remove the responsibility for training from the board of governors of a teaching hospital would be like removing the responsibility for the training of his men from a commanding officer. It was erroneous to imagine that by pooling the resources of all types of hospital more nurses would be available. It seemed to him that the views of the boards of governors of teaching hospitals had been overlooked by the Minister.

Mr. DIAMOND said he had been struck recently on going round a children's hospital to see the way in which the children waved and said, "Hello, Matron." When he himself had been a patient twenty-five years ago a deadly hush fell over the ward as the matron was about to approach.

Mr. HOWARD said that to suggest that the working party's report was generally accepted by the nursing profession would be entirely false.

Mrs. MANNING said so far the nursing profession had mainly looked for recruits among girls leaving secondary grammar schools. Its attention must be called to girls leaving the modern schools. Every year 82,900 girls left modern schools against 35,000 who left secondary grammar schools. Of the latter the teaching profession required 11,000. If the great teaching hospitals were brought under regional boards many difficulties would disappear.

Retaining Student Nurses

Mr. SOMERVILLE HASTINGS felt that the teaching hospitals would be better able to make their contribution in medicine and in nursing as members of the Standing Nurse Training Committee rather than as isolated from it. Much had been said in the debate about the need to obtain more student nurses, but there was a greater need for retaining them. In few schools of nursing in this country was the proportion of those who did not finish less than 40%. Nursing must be taught at the bedside, but the curriculum should be determined by the needs of the nurse rather than by the needs of the hospital. While most hospitals had 30% of trained nurses, the other 70% were nurses who had not completed their training. The sister of a ward should equal in rank the physician or surgeon in charge of the ward. The knowledge which house-physicians and house-surgeons acquired was to a large extent due to the sister of the ward, who was able to keep them on the right lines. If the training of a nurse was made more practical and intensive it could be carried out in a much shorter time. Two years' training ought to suffice for a nurse who did not want training of a degree that would fit her to become a sister or matron. He thought that nursing staffs could be diluted much more. It seemed absurd to see two trained nurses making one bed.

Mr. LINSTEAD said the difficulty in making better use of trained nurses was that in London at any rate it was as difficult to get domestic staff as to get nursing staff. There was a danger of the nursing army becoming all officers. He urged fuller recognition for the assistant nurse.

Dr. H. B. MORGAN said that when nurses went into their hospitals they should have not only a workshop but also a home. Many hospitals required modernization. Sanitation and culinary arrangements were often bad. The diet was bad and the relationship between the supervisors of the nurses and the nurses was bad. He asked that the mental side of nursing should have greater representation on the General Nursing Council. Although midwives had been long dissociated from the nursing profession they should be included in the General Nursing Council.

Government Reply

Mr. BLENKINSOP, replying for the Government, said the Bill had received a great welcome from all parts of the House. Many of the points made in the discussion should be debated in committee. At the moment more nurses were in training than ever before. In fact they had some 48,000 nurses in training to-day. In 1938, 6,700 were admitted to the *Register*, 7,900 in 1947, and 7,560 in 1948. The number of those who sat for the preliminary examination was 9,500 in 1948, 11,000 in 1947, and 13,000 in 1948. In 1948, 11,000 passed, which seemed a higher proportion than before the war. They could be satisfied that they were getting a steady though slow recruitment into the nursing profession. Teaching hospitals trained only a small proportion of nurses.

The Government felt that they needed the experience and advice of the teaching hospitals on the regional committees. Any difference between the teaching hospital and the regional committee could be referred to the General Nursing Council. The teaching hospitals could be sure they need not fear any

reduction of their standards in consequence of this Bill. In the House of Lords it had been agreed that the proposals in the Bill safeguarded the position of the teaching hospital. In considering the training needs of its area the standing committee would obviously take into consideration the needs of the training hospital.

The Ministry of Health was examining the avenues of recruitment to the nursing profession which had been mentioned by Mrs. Manning. He was prepared to consider whether legal experience would be helpful to the General Nursing Council in considering removals from the *Register*. The House would have to ensure that the statutory finance committee was a strong one and properly representative. He emphasized that the Bill was no more than an opportunity for the profession itself to take action which was urgently needed.

The Bill was then read a second time without a division and the accompanying Money Resolution was carried after Mr. Blenkinsop had explained that under it the Exchequer would have full power to grant 100% of the expenses incurred by the General Nursing Council.

NURSES (SCOTLAND) BILL

Mr. WOODBURN on October 20 moved the second reading of the Nurses (Scotland) Bill. This Bill had already passed the House of Lords (*Journal*, August 6, p. 337). He said the Bill was designed primarily to improve the training of nurses in the light of the majority report of the Working Party on Nurses of 1947. No one wished to disturb the arrangement under the 1919 Act by which direction of training and registration of nurses had been entrusted to the General Nursing Council of Scotland. The Bill proposed changes in the constitution of the Council to permit developments agreed to be desirable. It was proposed to increase the Council to 26 members—13 elected by the nurses, 11 by the Secretary of State, and two by the Privy Council. It was proposed to add a further statutory committee to the General Council to be called the Mental Nurses Committee.

The working party had reported a tendency in some hospitals to subordinate training to staffing requirements. It was considered necessary to provide special machinery for training purposes at the regional level, and nurse-training committees would be established under the Bill. The functions of these training committees would include approval of institutions for the purposes of training, and the committees were empowered to prepare schemes to improve facilities for training in their areas. Any representations they made would be considered by the General Nursing Council before the scheme was approved. the training committees would also have power to promote research and investigation into matters relating to nurse training.

The finance of training was to be separated from hospital finance generally. He believed that these improvements in the training of nurses would lead to a lower rate of wastage in training and make the profession more attractive. Clause 8 gave the General Nursing Council wide powers to admit and register nurses trained abroad. Nursing organizations in Scotland had no objection in principle to any part of the Bill.

Mr. WALTER ELLIOT and Dr. H. B. MORGAN opened the debate that followed. Mr. JOHN WHEATLEY, replying for the Government, said that he thought the Bill would improve the intake of nurses and prevent a decline of numbers. He paid tribute to the part-time nurses who had made it possible for many hospitals to carry on their work. He agreed that nothing shall be done to diminish the status and prestige of hospitals such as the Royal Infirmary, Glasgow, the Royal Infirmary, Edinburgh, the Victoria Infirmary, Glasgow, or the Royal Infirmary, Aberdeen. They should build up the status and prestige of the other hospitals.

The Bill was then read a second time without a division and the money resolution associated with it was approved.

Absenteeism in Ordnance Factories

Mr. STRAUSS on October 24 said the paid sick leave arrangements operating in the Royal Ordnance factories for industrial employees were those laid down in the scheme which applied to all Government industrial employees. The scheme, which was due for review in September, 1950, provided that after a qualifying period of six months employees might in any period of one year be granted sick leave with full pay, up to a maximum of 13 weeks, less the amount of any National Insurance benefit. Paid sick leave was conditional on production of medical certificates of unfitness obtained from a medical practitioner, who was normally the National Health Service doctor. The cost of the scheme in Royal Ordnance factories for the 12 months from its introduction in September, 1948, was £296,959. The following table showed the percentage of working days lost by industrial employees in the factories on account of absence covered by medical certificates in the 12 months preceding and following its introduction:

Month	1947–8	1948–9
September	2.5	3.5
October	2.8	5.1
November	2.9	6.0
December	2.7	6.1
January	3.2	7.6
February	3.1	8.1
March	2.7	9.0
April	2.4	7.1
May	2.5	5.8
June	2.1	4.9
July	1.8	3.9
August	2.2	3.9

Mr. Strauss said he was concerned by the increase shown in these figures. This was being thoroughly investigated. Appropriate disciplinary action was taken by the Ministry of Supply in cases of abuse.

Vitamin E for Heart Disease

Mr. DUMPLETON on October 24 asked what research was being carried out by the Medical Research Council into the claims made as to the effectiveness of α-tocopherol therapy for heart diseases.

Mr. HERBERT MORRISON replied that a trial of vitamin E in the treatment of angina pectoris had been carried out with financial support from the Medical Research Council. The results did not bear out the suggestion that vitamin E should be used in the routine treatment of this condition. If there was any change in the evidence, the Medical Research Council would be willing to consider it again.

Sir HENRY MORRIS-JONES said that results differing from those of the Medical Research Council had been obtained by highly reputable investigators in a clinic in Canada. Beneficial effects had been obtained from the vitamin in this country. Sir Henry urged Mr. Morrison to influence the Minister of Health to give a licence so that the product could be imported into the United Kingdom in sufficient quantities to give proper results.

Mr. MORRISON said the investigators of the Medical Research Council had taken full account of the investigations in Canada. Carefully controlled attempts to repeat Dr. Shute's observations in this country and America had mostly given negative results.

Cases Referred to R.M.O.—The number of cases in which claimants to sickness benefit were referred to Regional Medical Officers for second medical opinions in the twelve months ended September 30, 1949, was 202,188. The number for the previous twelve months was 75,189.

Spectacles and Prescriptions.—Pairs of spectacles supplied for the years ended September 1, 1948 and 1949, respectively, were 4,400,000 pairs and 6,900,000 pairs. Mr. BEVAN suggested on October 27 that the supply in the following year would be at least 9,000,000 pairs. In England and Wales in the quarter ended June 30, 1949 there were about 46,000,000 prescriptions dispensed.

The Services

The Efficiency Decoration and 1st Clasp of the Territorial Army has been conferred upon Major F. V. Allen, O.B.E., R.A.M.C., T.A.

The Efficiency Decoration of the Territorial Army has been conferred upon Lieutenant-Colonel H. D. Chalke, O.B.E., and Major A. D. Stoker, R.A.M.C., T.A.

Universities and Colleges

UNIVERSITY OF OXFORD

An examination will be held at Worcester College on Tuesday, January 3, 1950, for the purpose of awarding a Nuffield Medical Scholarship of the value of £100 a year, and tenable for four years. Application for entry forms should be made to the Provost of Worcester College not earlier than November 19, and not later than December 3, 1949, and the forms should be returned by December 10.

In a Congregation held on October 13 the following medical degrees were conferred:

M.D.—J. G. Widdicombe, E. A. D. W. Simpson, R. W. Torrance, *Nina A. Cohen.

*In absence.

UNIVERSITY OF LONDON

Professor H. L. Sheehan will deliver a lecture on "Post-partum Necrosis of the Anterior Pituitary Gland" at the Westminster Medical School (Meyerstein Lecture Theatre), Horseferry Road, Westminster, London, S.W., on Wednesday, November 9, at 5 p.m. The lecture is addressed to students of the University and to others interested in the subject. Admission is free, without ticket.

Forrest Fulton, D.M., has been appointed to the University Readership in Bacteriology and Immunology tenable at the London School of Hygiene and Tropical Medicine from October 1.

The title of Professor Emeritus of Physiology in the University has been conferred on C. A. Lovatt Evans, D.Sc., LL.D., F.R.C.P., F.R.S., on his retirement from the Jodrell Chair of Physiology at University College which he has held since 1926.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At the annual meeting of the College held on October 19, the following officers were elected for the ensuing year: *President*, Mr. W. Quarry Wood; *Vice-president*, Mr. Frank E. Jardine; *Secretary and Treasurer*, Mr. J. J. Mason Brown; *Representative on the General Medical Council*, Sir Henry Wade; *Conservator of Museum*, Mr. James Norman Jackson Hartley; *Convener of Museum Committee*, Mr. John Bruce; *Librarian*, Dr. Douglas Guthrie.

The following candidates having passed the requisite examinations were admitted Fellows: S. J. Barr, A. El H. Bayoumi, C. F. A. Cummins, G. A. Fraser, S. Govindan, N. N. S. Grewal, K. S. Jones, T. Lawrie, H. A. Maslowski, M. L. Mason, W. Mathews, J. F. O. Mitchell, C. M. C. Potter, W. Recht, C. Remington-Hobbs, T. A. Sale, A. M. Shohdy, M. J. Smyth, A. Tomney, T. M. Welsh, I. W. Winchester, S. Witt.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

At the annual meeting of the College held on October 18, the following officers were elected: *President*, Dr. Leonard Abrahamson; *Vice-president*, Dr. P. T. O'Farrell; *Censors*, Drs. E. B. McEntee, J. Duffy, and J. G. Gallagher.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a meeting of the Council held at the College House on October 13, with the President, Sir William Gilliatt, in the chair, the following were admitted to the Membership of the College: A. B. Backus, Jessie E. C. Baird, T. E. C. Barns, Anusya Bhagat, D. H. Blakey, V. Y. Bockner, S. C. Bose, M. B. Bruce, R. C. Cummin, Mona M. Davin-Power, R. G. Denniss, H. Doberman, T. Dougray, L. W. D. Drabble, C. T. F. Ealand, G. K. Emsley, G. M. Evans, J. J. Foley, P. S. Gardner, G. W. Garland, H. K. B. Geiser, Elizabeth Gilbertson, Marie P. S. Grant, G. T. Hammond, J. C. Harvey, J. Henderson, J. A. Henderson, D. W. Hendry, R. W. Hutchinson, E. W. Ilangantileke, E. P. Jones, F. G. E. King, J. M. King, E. W. Kirk, Joan E. M. Lambert, D. Latto, J. G. Lawson, F H. Leckie, E. M. Leyland, J. W. F. Lumsden, J. M. McCracken, I. MacGillivray, H. N. Mansfield, S. M. Medine, W. G. Millar, R. Moolan-Feroze, Ll. O. Morgan, M. R. Neely, F. C. R. Picton, J. G. Reynolds, N. A. Richards, S. Riterband, T. W. Roddie, C. A. Samad, E. M. Sandler, Olive C. Sandys, J. W. F. Scrimegeour, Sita Sen, J. G. Shelton, Norah P. Sherlock, J. A. McC. Smith, Doreen M. J. Stracey, A. B. Swarbreck, J. L. Taylor, S. D. Tewary, J. Watson, G. F. J. Williams.

The address of Nursing Services Branch of the Ministry of Labour and National Service has been changed to: 3, St. James's Square, London, S.W.1 (Telephone: WHItehall 5484).

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended October 15. [No. 41

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1949 (a)	(b)	(c)	(d)	(e)	1948 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	29	3	12	1	1	36	5	10	—	1
Deaths		1	—				1	1		
Diphtheria	85	9	32	1	1	141	8	43	17	3
Deaths	1	—	—	—	—	1	—	—	—	—
Dysentery	179	10	75	2	3	114	9	70	—	1
Deaths				—	—					—
Encephalitis lethargica, acute	—	—	—	—	—	1	—	—	—	—
Deaths		—					—			
Erysipelas			31	10	2			23	11	2
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				100					51	
Deaths	40	1	12	9	4	22	1	4	4	3
Measles*	992	44	42	108	42	4,536	78	74	49	66
Deaths†			—	—	—			1	—	—
Ophthalmia neonatorum	43	2	8	—	—	55	6	7	—	—
Deaths										
Paratyphoid fever	13	—	3 (B)	3 (B)	—	9	4	4 (B)	—	—
Deaths	1	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal	354	23	2	2	4	479	25	1	3	—
Deaths (from influenza)‡	6	2	1	—	—	7	1	1	—	1
Pneumonia, primary			164	25				163	16	
Deaths	135	23		9	7	171	23		3	6
Polio-encephalitis, acute	45	5				7	1			
Deaths										
Poliomyelitis, acute	418	63	3	4	—	81	5	5	4	—
Deaths§	20	3				8	1			
Puerperal fever		—	13				—	9		—
Deaths										
Puerperal pyrexia‖	108	7	8	1	—	100	11	6	—	1
Deaths		—					—			
Relapsing fever	1	1			—	—	—			—
Deaths										
Scarlet fever	1,844	155	243	85	144	1,519	103	324	206	36
Deaths†			—	—	—			—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	14	1	1	4	1	12	1	2	1	—
Deaths	—	—	—	—	—	1	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	875	51	68	31	32	1,949	146	83	22	10
Deaths	3	—	—	1	—	4	—	1	—	—
Deaths (0–1 year)	258	32	32	25	13	258	27	33	19	6
Deaths (excluding stillbirths)	4,079	635	530	144	100	4,336	718	562	139	118
Annual death rate (per 1,000 persons living)			10·6	8·9				11·3	8·7	
Live births	7,442	1163	858	395	264	7,491	1220	929	338	237
Annual rate per 1,000 persons living			17·2	24·5				18·7	21·1	
Stillbirths	192	25	11			197	21	28		
Rate per 1,000 total births (including stillborn)			13					29		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications in the week ended October 22 were: poliomyelitis 385 (418), polio-encephalitis 29 (45). Figures for the previous week are in parentheses. It is hoped that the decline will be maintained, but it is to be expected that the figures will remain higher than usual at least until the end of the year.

Multiple cases (poliomyelitis and polio-encephalitis together) occurred in the following counties: London 66 (68), Bedford 3 (7), Berkshire 6 (4), Chester 8 (7), Cornwall 4 (6), Cumberland 2 (7), Derby 5 (2), Dorset 3 (10), Durham 3 (4), Essex 32 (39), Gloucester 12 (21), Hertford 6 (11), Kent 26 (33), Lancaster 25 (32), Leicester 13 (10), Lincoln, Lindsey 7 (0), Middlesex 19 (18), Norfolk 8 (8), Northampton 2 (4), Northumberland 9 (3), Nottingham 9 (11), Somerset 10 (9), Southampton 13 (10), Stafford 12 (3), Surrey 16 (14), East Sussex 2 (4), West Sussex 2 (2), Warwick 9 (16), Westmorland 2 (0), Wiltshire 4 (8), Worcester 2 (1), East Yorks 3 (3), North Yorks 3 (3), West Yorks 47 (48), Glamorgan 6 (4), Monmouth 4 (1).

Discussion of Table

In *England and Wales* there were increases in the notifications of scarlet fever 220, acute poliomyelitis 78, measles 66, and acute pneumonia 42, with decreases in the incidence of dysentery 111 and whooping-cough 33.

A slight increase in the incidence of scarlet fever was recorded in most regions; the only notable increase was 79 in Lancashire. The chief centres of scarlet fever in this county were Liverpool C.B. 63 and Manchester C.B. 61.

The local returns for measles showed little change; the largest rises in incidence were Durham 44 and Norfolk 30. Notifications of diphtheria were fairly constant, and the chief centres of infection were Liverpool C.B. 16 and Birmingham 11. In the incidence of whooping-cough, the largest changes were a decrease in Yorkshire West Riding 37 and increases in Lancashire 25 and London 20.

Of the 13 cases of paratyphoid fever 8 were notified in Lancashire. Notifications of dysentery fell from 217 to 108 in Lancashire; the largest returns during the week were Ince in Makerfield U.D. 31, Abram U.D. 20, Hindley U.D. 20, and Liverpool C.B. 18. Other large returns for dysentery were Durham 11 (Hetton U.D. 9) and London 10. Of the 29 cases of cerebrospinal fever 9 were notified in Birmingham C.B.

In *Scotland* there were increases in the notifications of scarlet fever 41, acute primary pneumonia 31, whooping-cough 21, and diphtheria 10. A rise of 13 in the notifications of diphtheria occurred in Glasgow. The increased incidence of scarlet fever was confined to the western area; in the remainder of the country there was a slight fall in incidence.

In *Eire* an increase of 33 in the notifications of measles and a decrease of 14 for scarlet fever were recorded. In Waterford C.B. there was an increase of 21 in the notifications of measles. For the fourth consecutive week a slight decrease was reported in the incidence of diarrhoea and enteritis.

In *Northern Ireland* a decrease of 19 in the notifications of scarlet fever was the chief feature of the returns. This fall was contributed by Belfast C.B.

Quarterly Returns for England and Wales

During the June quarter the birth rate was 17.7 per 1,000, compared with 18.8 for the second quarter of 1948. The infant mortality was 30 per 1,000 live births and was the lowest ever recorded for any second quarter, being 1 below the rate for the June quarter of 1948 and 17 below the average for the second quarters of the ten years 1938–47. The death rate was 11.1 compared with 10.2 for the preceding second quarter and an average of 10.7 for the second quarters of 1943–7. Deaths attributed to acute poliomyelitis and polio-encephalitis numbered 28. There were 20 cases of smallpox notified, with 5 deaths.

Quarterly Returns for Northern Ireland

The birth rate during the second quarter was 22.9 per 1,000, being 1.3 below the average of the five preceding second quarters. Infant mortality was 38 per 1,000 registered births and was 17 below the average of the corresponding quarters of the five preceding years. The death rate was 11.2 per 1,000, being 0.8 below the average of the five preceding second quarters. Deaths due to the principal epidemic diseases numbered 68, and included 29 from influenza, 21 from diarrhoea and enteritis, 10 from whooping-cough, and 4 from diphtheria. Deaths from pulmonary tuberculosis numbered 169 and from other forms of tuberculosis 48; these figures were 36 and 29 respectively, below the average of the second quarters of 1944–8.

Vital Statistics

In reply to a question in the House of Commons on October 27 the following table was circulated.

	Death Rate per 1,000 Total Population	Birth Rate per 1,000 Total Population	Infant Mortality Rate per 1,000 Related Live Births
1933	12·3	14·4	63
1938	11·6	15·1	53
1948*	10·8	17·9	34
1949			
March quarter*	15·0	17·4	40
June quarter* ..	11·1	17·7	30
Sept. quarter* ..	9·2	16·7	26

* Provisional

The expectation of life at birth in 1938 was 61.40 years for males and 65.84 for females. In 1945 it was 62.56 for males and 68.58 for females.

Week Ending October 22

Notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,909, whooping-cough 834, diphtheria 92, measles 1,052, acute pneumonia 317, cerebrospinal fever 24, acute poliomyelitis 385, acute polio-encephalitis 29, dysentery 154, paratyphoid fever 18, typhoid fever 6, food-poisoning 88.

Medical News

Commonwealth Fund Fellowships

Fellowships tenable in the United States are offered to British subjects by the Commonwealth Fund of New York. The fellowships, which are not only medical, are in four categories: (1) 20 ordinary fellowships are open to candidates who (*a*) are over 23 and under 35 years old on September 1 of the year of award, and (*b*) have not worked or studied in any educational or research institution in the United States for one or more academic years. Candidates in the United Kingdom and Northern Ireland must be university graduates. (2) Five home Civil Service fellowships are open to candidates holding permanent appointments in the higher ranks of the Civil Service in Britain (three for administrative grades and two for technical and professional grades). (3) Five Dominion Civil Service fellowships are open to candidates who hold appointments under the Governments of Australia, New Zealand, and South Africa. (4) Two Colonial Civil Service fellowships are open to candidates who hold appointments under the Governments of the British Colonies, protectorates, and trust territories. Particulars may be obtained from the secretary of the Committee of Award, 35 Portland Square, London, W.1.

B.M.S.A. Report

The British Medical Students Association has issued its annual report for the year 1948–9, which gives a summary of the association's many activities at headquarters and in the regions. Copies may be seen in the medical school libraries, and are held also by B.M.S.A. representatives in the medical schools.

French Award

The Médaille de la Reconnaissance Française has been presented to Mr. Arthur Miller.

Eric Guttman Memorial Trust

A trust in memory of the late Eric Guttman was founded recently by his widow, Dr. Elizabeth Rosenberg. Its purpose is: (*a*) To further the development of the Guttman–Maclay collection of pictures and books related to art and psychiatry; (*b*) to help the medical staff of the Bethlem Royal and Maudsley Hospitals (other than staff of consultant status) to attend scientific meetings and conferences; and (*c*) to furnish loans to young psychiatrists to further their psychiatric training. Further particulars may be obtained from: The Trustees, Eric Guttman Memorial Trust, Maudsley Hospital, Denmark Hill, London, S.E.5.

New School of Occupational Therapy

The Derby School of Occupational Therapy was opened on October 27 by Dr. H. Balme, of the Ministry of Health Rehabilitation and Resettlement Department. The school is the seventh of its kind in the country and the first which forms part of the National Health Service. Miss I. Fitchett, M.A.O.T., formerly head occupational therapist to the United Sheffield Hospitals, is the principal. The courses last three years, and will be carried out in conjunction with the Derby School of Arts and Crafts. Practical experience will be provided in the general, orthopaedic, and mental hospitals in the area. There will be at least 60 students when the school is in full operation. The suggested formation of this school was first submitted to the Derby Corporation Health Committee in 1946. A meeting of representatives of the Derby Corporation and Derbyshire County Council Hospitals and Education Committees, the local voluntary hospitals, and the medical profession endorsed the project, and advice was obtained from the Association of Occupational Therapists. In view of the imminence of the "Appointed Day" (Health Act) the scheme was referred to the Sheffield Regional Hospital Board and approved. After July 5, 1948, a joint subcommittee consisting of representatives from each of the four Derby Area Hospital Management Committees, the local authorities' education committees, and the medical profession was appointed to administer the school.

Wessex Rahere Club

The second annual dinner of the Wessex Rahere Club was held at the Spa Hotel, Bath, on October 15. Sir James Paterson Ross was the guest of honour and the chairman was Mr. C. E. Kindersley. The secretary reported that membership of the club, which was open without subscription to all Bart's men in the South-west, was now well over 100 and increasing steadily. Professor R. A. Brocklehurst was unanimously elected chairman for 1949–50. It was agreed that the third annual dinner would be held in Bristol on October 21, 1950. The toast of the hospital was proposed by Mr. C. E. Kindersley and linked with the name of Sir James Paterson Ross. In reply, Sir James outlined the present plans for the reconstruction and development of St. Bartholomew's Hospital, and mentioned particularly the progress which was being made at the Charterhouse site and in the provision of a residential hostel. He emphasized that the quality of the students entering the hospital was as high as ever. It is hoped that any Bart's men who are interested, and are not yet in touch with the club, will notify their whereabouts to the honorary secretary, Mr. A. Daunt Bateman, 3, The Circus, Bath.

The Sherrington Society

A new society named after Sir Charles Sherrington has been formed at Liverpool by a group of students who have taken an honours degree in physiology and are continuing their studies in clinical medicine and dentistry. The aim of the society is to bring together clinicians and those who study the basic medical sciences. The first meeting was held on October 19, when Sir Henry Cohen addressed an audience of about 300 people on "Some Aspects of Pain." The next meeting will be held on November 9 at 7.30 p.m. in the physiology lecture theatre of the University and will be addressed by Professor A. C. Frazer, of Birmingham, on "Studies of Normal and Abnormal Fat Absorption in the Human Subject."

American Scholars

Five American scholars have recently arrived in this country under the auspices of the United States Educational Commission to study various aspects of medicine for about nine months. It is the wish of the Commission that they should have opportunities of meeting as many British men and women as possible of similar interests. Their names and where they are working are as follows: Dr. R. W. Russell, Institute of Psychiatry, London University; Dr. E. Sachs, Jun., National Hospital, Queen Square, London; Dr. J. E. Thompson, Nuffield Institute for Medical Research, Oxford University; Dr. R. Driver, Edinburgh University; and Miss J. L. Brand, London School of Economics.

Ministry of Food Model By-laws

The Ministry of Food has just issued to local authorities a series of model by-laws intended to supplement measures already in force under the Food and Drugs Act, 1938. They replace the series prepared by the Ministry of Health in 1939 and should help to secure the observance of sanitary and cleanly conditions in the handling, wrapping, and delivering of food. Local authorities and trade associations were consulted in the preparation of these model by-laws, and their provisions cover personal hygiene, cleanliness and good order of equipment, cleanliness of wrapping materials, and the deposit and removal of refuse.

Medical Golfing Society

The following prizes were won at the autumn meeting of the Medical Golfing Society at Sandwich: Canny Ryall Cup, by Dr. H. McCann; Rolf Creasy Salver, by Mr. E. B. Whittingham; Lindsay-Rea Cup, by Mr. T. A. Torrance; Veterans Cup, by Mr. W. McK. H. McCullagh; Milsom Rees Cup, by Dr. M. B. Stungo.

Paediatrician in Portugal

Professor Alan Moncrieff, Nuffield Professor of Child Health in the University of London, is lecturing in Portugal under the auspices of the British Council. He returns on November 10.

Prospective Conservative Candidate

Dr. A. Genevieve Rewcastle has been chosen prospective Conservative candidate for West Willesden. This is Dr. Rewcastle's first Parliamentary candidature. During the war she served in the W.R.N.S., being the only woman to attain the rank of surgeon lieut.-commander.

COMING EVENTS

Adlerian Society

A meeting of the medical section of the Adlerian Society of Great Britain will be held at 11, Chandos Street, Cavendish Square, London, W., on Thursday, November 10, at 8 p.m., when Dr. Morris Robb will lecture on "Psychotherapy of Psychotics." The discussion will be opened by Dr. R. Dennistoun Scott.

Scientific Films

The London Optical Practitioners' Branch of the Association of Scientific Workers is holding an evening of scientific films of special interest to optical and medical practitioners at Friends' House, Euston Road, London, N.W., on Thursday, November 10, at 7.30 p.m. The admission charge is 2s.

The Victor Horsley Memorial Lecture

The Victor Horsley Memorial Fund, which was raised in 1920 to commemorate the services of Sir Victor Horsley to science and the Empire, is devoted to the giving of a lecture triennially in London entitled the "Victor Horsley Memorial Lecture." By invitation of the trustees (the Presidents for the time being of the Royal Society, the Royal College of Surgeons of England, and the British Medical Association, the Senior Physician of the National Hospital, Queen Square, and Mr. Stanley G. Robinson, son-in-law of Sir Victor Horsley) the eighth lecture will be delivered by Sir Hugh Cairns, Nuffield Professor of Surgery, University of Oxford, in No. 1 Lecture Room, University College Hospital Medical School, University

Street, Gower Street, London, W.C.1, on Thursday, December 8, at 5 p.m. The title of the lecture is "Disturbances of Consciousness with Disorders of the Brain Stem," and the chair will be taken by Dr. F. M. R. Walshe, F.R.S. Admission to the lecture is free on presentation of visiting-card.

Manchester Royal Infirmary Old Residents' Club

Members are asked to note that it is proposed to hold the next reunion of old residents on Saturday, March 25, 1950, at Belle Vue, Manchester. Further details will be notified later. Members should notify any recent change of address to the Honorary Secretary, Old Residents' Club, Manchester Royal Infirmary.

SOCIETIES AND LECTURES

Monday

LONDON UNIVERSITY.—At University College (Chemistry Theatre), Gower Street, London, W.C., November 7, 5.15 p.m., "*The Chemistry of the Transuranics and Other Newly Discovered Elements*," by Professor H. J. Emeléus, F.R.S.

UNIVERSITY COLLEGE, Gower Street, London, W.C.—November 7, 4.45 p.m., "*Bacterial Toxins*," by Dr. W. E. Van Heyningen.

Tuesday

CHELSEA CLINICAL SOCIETY.—At South Kensington Hotel. 47, Queens Gate Terrace, London, S.W., November 8, 7 for 7.30 p.m., "*A Stipendiary Magistrate*," discussion to be opened by Mr. W. B. Frampton.

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE.—At University New Buildings (Anatomy Lecture Theatre), Edinburgh, November 8, 5 p.m., "*The Costoclavicular Syndrome*," by Professor F. A. R. Stammers.

ILLUMINATING ENGINEERING SOCIETY.—At the Lighting Service Bureau, 2, Savoy Hill, London, W.C., November 8, 6 p.m., *Specialized and General Lighting in Hospitals*," by Messrs. M. W. Peirce and D. J. Reed. A discussion will follow.

INSTITUTE OF DERMATOLOGY, 5, Lisle Street, Leicester Square, London, W.C.—November 8, 5 p.m., "*Histopathology of the Skin*," by Dr. I. Muende.

INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Postgraduate Medical School of London, Ducane Road, W., November 8, 3 p.m., "*Kidney Function*," by Professor K. J. Franklin.

Wednesday

CAMBRIDGE UNIVERSITY.—At Addenbrooke's Hospital, Cambridge. November 9, 2.30 p.m., "*The Teaching Hospital and the General Practitioner*," by Dr. L. B. Cole.

LONDON UNIVERSITY.—At Westminster Medical School (Meyerstein Lecture Theatre), Horseferry Road, Westminster, London, S.W., November 9, 5 p.m., "*Post-partum Necrosis of the Anterior Pituitary Gland*," by Professor H. L. Sheehan.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW. 242, St. Vincent Street, Glasgow.—November 9, 5 p.m., "*The Relation of Hypertension to Renal Circulation*," Dr. John Burns Lecture by Professor J. Trueta.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—November 9, 3.30 p.m., "*Skin Ailments and the Public Health*," by Dr. W. J. O'Donovan.

SOCIAL PSYCHOTHERAPY CENTRE, 7, Fellows Road, London, N.W.—November 9, 5 p.m., "*Instructional Group Psychotherapy, II*," by Dr. E. N. Snowden.

SOCIETY OF CHEMICAL INDUSTRY: FOOD GROUP.—At Imperial Institute, South Kensington, London, S.W., November 9, conversazione. 6 p.m. Informal reception by Sir Harry and Lady Lindsay and Mr. A. L. Bacharach (chairman of the society) and Mrs. Bacharach; 6.45 p.m., film of Food Group on tour in France, June, 1949. Admission by ticket only.

SOUTH WEST LONDON MEDICAL SOCIETY.—At Bolingbroke Hospital, London, S.W., November 9, 8.30 p.m., "*Hoarseness as a Symptom*," by Mr. W. I. Daggett.

Thursday

HONYMAN GILLESPIE LECTURE.—At Anatomy Theatre, University New Buildings, Teviot Place, Edinburgh, November 10, 5 p.m., "*Amputations, with Special Reference to the 'Phantom Limb' Phenomena*," by Mr. G. H. Stevenson.

INSTITUTE OF DERMATOLOGY, 5, Lisle Street, Leicester Square, London, W.C.—November 10, 5 p.m., "*Leukoplakia: Lichen Sclerosus of the Ano-genital Region*," by Dr. H. J. Wallace.

INSTITUTE OF PHYSICS: MANCHESTER AND DISTRICT BRANCH.—At College of Technology, Manchester, November 10, 6 p.m., "*Recent Advances in the Physiology of Colour Vision*," by Professor H. Hartridge, F.R.S. Joint meeting with the Illuminating Engineering Society.

LIVERPOOL MEDICAL INSTITUTION.—November 10, 3 p.m., "*Physiological Reactions of Bone and the Problem of Non-union Fractures*," Hugh Owen Thomas Memorial Lecture by Sir Reginald Watson-Jones.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, 17, Bloomsbury Square, London, W.C.—November 10, 7.30 p.m., "*The British Pharmaceutical Codex, 1949*," by T. C. Denston, B.Pharm., Ph.C., F.R.I.C.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.—November 10, 5 p.m., "*Sarcoidosis, with Special Reference to the Lung Changes*," Bradshaw Lecture by Dr. J. G. Scadding.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—November 10, 5 p.m., "*Visceral Actinomycosis and its Treatment*," Bradshaw Lecture by Mr. V. Zachary Cope.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, London, S.W.—November 10, 4.30 p.m., lecture-demonstration: "*Psychiatry*," by Dr. D. Curran.

TORQUAY AND DISTRICT MEDICAL SOCIETY.—November 10, 8.30 p.m., clinical discussion.

Friday

MAIDA VALE HOSPITAL FOR NERVOUS DISEASES MEDICAL SCHOOL, Maida Vale, London, W.—November 11, 5 p.m., clinical demonstration by Dr. Blake Pritchard.

ROYAL INSTITUTE OF PHILOSOPHY, 14, Gordon Square, London, W.C.—November 11, 5.15 p.m., "*Scientific Concepts and Synthetic Philosophy*," by Mr. S. E. Toulmin.

ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh.—November 11, 8 p.m., "*Unorthodox Healing—An Assessment*," by Mr. R. C. Tyldesley.

ROYAL SANITARY INSTITUTE.—At Huddersfield Technical College, November 11, 10 a.m., "*Recent Regulations Relating to Milk*," by Dr. John M. Gibson.

SOCIETY OF CHEMICAL INDUSTRY: FINE CHEMICALS GROUP.—At King's College (Chemistry Lecture Theatre), Strand, London, W.C., November 11, 7 p.m., "*The Chemistry of Antihistamine and Related Drugs*," by Dr. D. W. Adamson, M.Sc. A discussion will follow.

UNIVERSITY COLLEGE, Gower Street, London, W.C.—November 11, 5.15 p.m., "*Transmission of Excitation in Nerve and Muscle*," by Dr. Bernhard Katz.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—At Miller Hospital, Greenwich High Road, London, S.E., November 11, 8.30 p.m., "*Some Conditions Affecting the Parotid Gland*," by Dr. R. S. Bruce Pearson.

Saturday

BIOCHEMICAL SOCIETY.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., November 12, 11 a.m., 281st meeting. Symposium: "*The Biological Oxidation of Aromatic Rings*."

APPOINTMENTS

Lieutenant-Colonel F. M. Lipscomb, F.R.C.P., has been appointed Physician and Surgeon to the Royal Hospital, Chelsea.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—*House-physicians (Junior Registrar Grade)*, T. J. Rendle-Short, M.B., B.Ch., M.R.C.P., D.C.H., E. H. Back, M.B., B.Ch., M.R.C.P., R. G. Mitchell, M.B., Ch.B., M.R.C.P., D.C.H. *House-surgeon (Junior Registrar Grade)*, R. J. Alcock, M.B., B.Ch. *Resident Medical Officer, Tadworth Court (Registrar Grade)*, Joan P. D'Arcy, M.B., B.Ch., B.A.O. *Assistant Resident Medical Officer, Tadworth Court (Junior Registrar Grade)*, Gwendoline Hewitt, M.B., B.S., D.G.O., D.C.H.

BARREN, G. F., M.D., Consultant Chest Physician in the King's Lynn and West Norfolk Area, East Anglian Regional Hospital Board.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Clift.—On October 21, 1949, at Croydon, to Dr. Dorothy (née Newell), wife of A. F. Clift, F.R.C.S., a sister for Priscilla and Theo—Mary Elizabeth.

Crittenden.—On October 26, 1949, to Stella (née Jolly), wife of Dr. Kenneth Crittenden, The Woodlands, Kings Bromley, a daughter—Rosemary Jean.

MARRIAGES

Affleck—Barrow.—On October 17, 1949, in London, Ian Affleck, O.B.E., M.R.C.S., L.R.C.P., of Kearsley, Farnworth, Lancs, to Yolande Barrow, of Cogny, Rhône, France.

Green—White.—On October 21, 1949, at St. Bodfan's Church, Aber, Caernarvonshire, David Mitchell Green, M.B., Ch.B., of 16, Ancrum Road, Dundee, to Elizabeth White, M.B., Ch.B., of Aber, Caernarvonshire, and 6, South Oswald Road, Edinburgh.

Pearse Williams—Wright.—On October 15, 1949, at Epsom, Thomas Pearse Williams, M.D., F.R.C.P., of 50, Harley Street, London, W., to Joyce Christina Wright, C.S.M.M.G., younger daughter of the late J. J. Muir Wright and of Mrs. Muir Wright, of Bucklands, Kingswood.

DEATHS

Bateman.—On October 21, 1949, at 199, Shooters Hill, London, S.E., James Alexander Bateman, M.B., Ch.B.

Crichton.—On October 21, 1949, at 31, Hillhead Street, Glasgow, W., David Macquorn Rankine Crichton, M.B., C.M., J.P., of Burgh House, Maryhill, Glasgow.

Harrowell.—On October 27, 1949, at 113, Tadcaster Road, York, Francis William Harrowell, M.B., Ch.B., formerly of Beeston Hill, Leeds, and late of Great Haywood, Staffs.

Harvey.—On October 25, 1949, at Chircheby House, Kirkby Malzeard, Ripon, Yorks, Robert George Mills Harvey, L.R.C.P.&S.I., aged 85.

Heasman.—On October 17 1949, at 18, Sea Road, Boscombe, Bournemouth, Frank Heasman M.R.C.S., L.R.C.P., aged 84.

Herriot.—On October 20, 1949, at 8, Castle Terrace, Berwick-on-Tweed, Thomas Pearson Herriot, M.D., D.P.H.

Moritz.—On October 18, 1949, at Stoney Hill, Walkerburn, Scotland, Arnold Moritz, M.B., B.Ch., late of Melbury Court, Kensington, London, W., aged 77.

Mallam.—On October 23, 1949, at Danetree, Compton, Berks, Dalton Mallam, M.R.C.S., L.R.C.P., of Irstead, Neatishead, Norfolk.

Morton.—On October 16, 1949, at 15, Fothringham Road, Ayr, John Kerr Morton, M.B., C.M., J.P., aged 84.

Needham.—On October 24, 1949, in London, Sir Richard Arthur Needham, C.I.E., D.S.O., M.D., F.R.C.S., Colonel I.M.S., Ret., aged 71.

Any Questions ?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Hard Water

Q.—*Is there any evidence that excessively hard water has a deleterious effect on the general health? Apart from increasing the hardness of a local supply of water, would the fact that it contains sea-water have any ill effect?*

A.—The controversy surrounding hard and soft water is an old one. Consumers are aware of the hardness of water by reason of its soap-destroying capacity and, where bicarbonates are present to any extent, by the accumulation of scale in kettles. It may well be that such effects have drawn attention to the harder waters, which would not otherwise have been associated with the various maladies which have from time to time been ascribed to them. Rheumatism, renal calculi, and a predisposition to dyspepsia are among the ills attributed to hard water. Some workers have held, further, that the nature of the substances giving rise to the hardness influences the effects upon consumers, and have contended that magnesium salts are more harmful than calcium salts. The daily requirement of calcium by the human body is of the order of a gramme, while that of magnesium is probably about half a gramme. The normal daily consumption of even a very hard water would not supply these quantities, and there can be no question of the body's receiving a surfeit of minerals through a hard water supply.

Investigations have been made to determine the relative states of health of large communities receiving hard as distinct from soft waters, but no evidence has been found that the general health has been affected one way or the other. Very soft waters may be plumbo-solvent; very hard waters are domestically inconvenient, and the consensus of opinion is that the ideal hardness for a public supply is about 100 parts per million. It may be added from experience that, except where a supply is unmistakably very soft, consumers often do not know whether their water supply is hard or not. In more than one area people have complained of the hardness of the supply when in fact it has been softened.

Underground supplies near the coast are sometimes subject to infiltration of sea-water. The susceptibility of individuals to salt in water varies somewhat, but a concentration of 700 parts per million is just detectable by most people. In some parts of Essex there is as much as 1,400 parts per million, but the local population apparently do not notice it or, if they do, have become accustomed to it.

Softened Water

Q.—*Are there any dangers in the use of artificially softened water for drinking purposes during pregnancy and for young children? Should the diet be supplemented in any way?*

A.—When water is softened, calcium is removed. Hard water used for drinking and cooking may supply 0.2 g. of calcium per day. The loss of this amount of calcium is unimportant unless the amount supplied by the rest of the diet is very low; a pint of milk supplies 0.7 g. Softening of water has no other action that might affect health.

Ultra-violet Lamp in the Home

Q.—*Is it possible, by an ultra-violet lamp used in the home, to retain a summer tan through the winter? Is it worth while doing, and would it confer any immunity to colds, influenza, and other winter infections?*

A.—The ultra-violet lamps used in the home have mercury-vapour emitters. The pigmentation caused by this spectrum is of a greyish tinge and is not the same as the tan caused by the solar spectrum or the carbon arc. Thus it is not possible to retain a true tan by the winter use of a lamp in the home. There is no scientific evidence that exposure to ultra-violet irradiation will confer immunity to colds, influenza, or other winter infections. A thorough investigation into this was carried out by the Industrial Health Research Board, whose report (No. 89) was published in 1946. This report was summarized in the *Journal*, and was the subject of a leading article on June 8, 1946 (p. 882).

Neostigmine in Myasthenia Gravis

Q.—*Where does neostigmine exert its action? What dosage is given for an early case of myasthenia gravis, and should administration be discontinued during remissions? Are any toxic or other undesirable effects likely to follow a long-continued course of treatment?*

A.—Neostigmine, like eserine, of which it is a synthetic analogue, acts at the neuromuscular junctions by inhibiting cholinesterase, which inactivates acetylcholine in the body. It thus increases the effect of acetylcholine liberated at the nerve endings. The exact cause of myasthenia gravis is unknown. The disease may be due to a deficiency of acetylcholine, to an excess of cholinesterase, or to the liberation of some curare-like poison. The dosage of neostigmine in myasthenia depends on the severity of the condition at the moment, and not on whether the case is in the early stages or long-standing. The drug is usually given by the mouth in 15-mg. tablets. Mild symptoms may be controlled by as little as two or three tablets a day, while severe symptoms may demand as much as 12 tablets in the 24 hours. In emergencies 1 to 2 mg. should be given by subcutaneous injection. There is no point in continuing the medication during a complete remission. Toxic effects—which are relieved by atropine—are intestinal colic, bradycardia, collapse, sweating, salivation, and miosis. They are due to overdosage or to unusual sensitivity to the drug and not to long-continued administration, as the effects of neostigmine are not cumulative.

Interpreting Laboratory Reports

Q.—*The result of a serum test is reported as follows: "Salmonella typhi (O and H), negative 1 in 25; Proteus OX19, OX2, and OX K., negative 1 in 50." What does this imply?*

A.—The absence from the blood of demonstrable antibody to the H and O antigens of *Salmonella typhi* suggests that the individual has not recently (say within the past two to three years) been inoculated against typhoid or suffered from a clinical attack of the disease. He might, of course, be in the early stages of infection, since antibody does not usually develop in the first week. A negative finding, however, does not necessarily mean that the individual is susceptible to typhoid fever. Some patients do not develop any demonstrable agglutinin during an attack, and in a proportion of inoculated persons the antibody titre may drop quickly to a low level; but this need not imply that the individual has not developed, or has lost, resistance to typhoid. Indeed, the function of humoral antibody as a protection against enteric infection is not easily defined. It is known that antiserum containing O or O+Vi antibody is protective against experimental infection in mice, but why does the patient with demonstrable antibody in the blood develop a relapse, and why do recently inoculated and reinoculated troops sometimes succumb to infection? On the other hand, among a susceptible civilian community exposed to the risk of infection, as by drinking contaminated water, only a proportion get a clinical attack. The serum of a chronic typhoid carrier may give negative reactions to the H and O antigens, but usually reacts positively (in a titre of 1 in 10 or higher) to the Vi antigen.

As much, or more, caution must be observed in interpreting a negative response to *Proteus OX19*, *OX2*, and *OX* K. in relation to rickettsial infection. In some severe cases of typhus, as well as in mild cases, the Weil–Felix test may show a very low titre to the *Proteus* antigen; in other patients this antibody quickly falls below demonstrable level. Yet all these patients are likely to have a high degree of resistance to further

infection by typhus, although not to other rickettsial infections, such as scrub typhus or Q fever. It should also be noted that, in a variable proportion of sera from normal persons with no history of infection or inoculation, antibodies to the *Salm. typhi* and *Proteus* antigens may be demonstrated in titres ranging from 1 in 20 to 1 in 100.

Vasomotor Rhinorrhoea

Q.—*What investigations should be undertaken in a case of persistent vasomotor rhinorrhoea? For three years a patient has suffered from a practically continuous severe vasomotor rhinorrhoea. There is a profuse discharge of mucus, and the need for continuous nose-blowing interferes with work and is a social handicap, besides being extremely fatiguing. He underwent an operation for deflected septum at the age of 17. The nares are patent during remissions; the sinuses are not infected; there is no seasonal incidence, and no evidence of sensitivity to a specific allergen. Causes of exacerbation are mechanical, neurogenic, and psychogenic. Complete but temporary relief is given by antihistamine agents applied locally and also by vigorous outdoor exercise. Is there any prospect of a cure?*

A.—The prospect of cure depends on finding the cause, which is often difficult. The appearance of the mucous membrane of the nose might give a guide to the cause. The nasal discharge should be examined on several occasions, during exacerbations and if possible during remissions, for eosinophil and polymorphonuclear leucocytes. If eosinophils only are found, the condition is allergic and the allergens are of the extrinsic type—for example, inhalants such as house dust, feathers, foods, and drugs. If eosinophils and polymorphs occur together, the condition is due either to a superadded infection of a basic allergic oedema (extrinsic in type) or to an allergic reaction to an infection. If only polymorphonuclear leucocytes are found, the condition is infective in origin, although it has been suggested that some of these apparently primary infective cases are really secondary infections on a boggy mucous membrane produced psychogenically.

In the allergic cases inhalants are the common allergens, and skin tests are thus often helpful. They are best carried out and their significance assessed by a competent worker in this field. Foods and drugs account for only a small proportion of cases of allergic rhinitis. In the absence of a personal or family history of allergy, with no eosinophils or pus cells in the nasal discharge, and with negative intracutaneous skin tests, a psychogenic cause should certainly be sought.

Fowls and Cantharides

Q.—*Has it ever been established that fowls which have ingested cantharides and have subsequently been killed and eaten have caused fatal effects in man?*

A.—No. We can find no reference to evidence that fowls which have eaten cantharides, and have subsequently been killed and eaten, have caused fatal accidents in man.

Frequent Attacks of Petit Mal

Q.—*What is the best treatment for a girl of 8 who has 20 to 50 attacks of petit mal daily? Attacks can be brought on by "over-breathing." While bathing she has no attacks and rarely when carrying out vigorous exercise. Does this type of case require any treatment other than the usual anti-epilepsy drugs?*

A.—Electroencephalography should be carried out, if this has not already been done, in order to ascertain the type of dysrhythmia present. An abnormal rhythm of the wave-and-spike variety would be an indication to try "tridione," but no other type of rhythm is likely to respond to this drug. In addition to the ordinary anticonvulsant drugs, it would be worth while trying belladonna in doses of 5 to 10 minims (0.3 to 0.6 ml.) of the tincture three times a day, and also amphetamine sulphate in doses of 2.5 mg. two or three times a day, the last dose being taken not later than tea-time. A ketogenic diet is sometimes successful, but it is probably impracticable outside a hospital to-day. Petit-mal attacks of such frequency are often described as pyknolepsy. There is doubt whether this is a nosological entity, but in some such cases, although the attacks respond little, if at all, to treatment, they cease spontaneously.

Washing out the Stomach

Q.—*In a case of non-corrosive poisoning, what advantage has gastric lavage over apomorphine plus plenty of salt and water?*

A.—When gastric lavage is used it is possible to be certain that the stomach has been thoroughly washed out by looking at the washing. Plenty of salt and water plus a dose of apomorphine would sometimes be just as efficient, but it might not always be so.

NOTES AND COMMENTS

Jealousy in a Child.—Colonel N. J. C. RUTHERFORD (Farnham, Surrey) writes: With reference to the question and answer on the above subject ("Any Questions?" August 27, p. 495), I have recently observed the same situation. A sturdy little boy aged 4 showed almost virulent dislike of his sister aged 2 years. It got so bad that neighbours grew alarmed and warned an anxious young mother. The boy would deliberately charge into his sister and knock her over; and when he thought himself unobserved he would make violent attacks on the little girl, who, incidentally, was a particularly gentle and shy child. There was no question of disability in the mother, but the father, being a Regular officer, was much away from home. The mother was firm in a way, but never used any form of corporal punishment to control the boy. Then the father came home for a longish spell of leave, and the situation changed rapidly. The boy was not smacked, but was shown plainly that ill-treatment of his sister meant isolation from the other members of the family and a marked air of general displeasure (somewhat spoilt by the little girl victim, who invariably made up to the naughty one during such sessions). Going to children's parties was beneficial, as sometimes the family spirit was aroused and the boy had to stand up for his sister against comparative strangers, which he did in no uncertain fashion, and acquired a protective spirit. In this case there is no doubt that a grandfather displayed like characteristics in his youth. I cannot see psychotherapy having much influence in this case. The boy is essentially masculine, full of pluck, has a mind of his own, is no fool, and will one day be a natural leader. It is just a phase and will pass away as the years grow.

Hunterian Society.—Dr. CLEMENT FRANCIS writes: The president and council of the Hunterian Society much appreciate the notice of the Hunterian party (October 15, p. 868). But there is one error in the opening sentence which I should be grateful if you could perhaps correct. The annual party is in *addition* to, and not *instead* of, the annual dinner which is to be held at Grosvenor House on February 16, 1950. The mistake has probably arisen from the fact that two years ago we were unable, because of rationing problems, to hold our usual annual dinner.

Treatment of Stings.—Captain J. F. Gow, I.A.M.C., writes from Kankinara, West Bengal: I have read correspondence off and on regarding bee stings and jelly-fish stings and I do not remember ever having seen vinegar and salt mentioned as a treatment. The treatment consists in taking about one teaspoonful of common salt and adding to it an equal quantity of vinegar and rubbing in the mixture well at the point of the sting. The relief is instantaneous, and no inflammation results. This treatment should be carried out as soon as possible after the individual has been stung.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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